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MACKENZIE VALLEY PIPELINE INQUIRY

IN THE MATTER OF AN APPLICATION BY CANADIAN ARCTIC GAS
PIPELINE LIMITED FOR A RIGHT-OF-WAY THAT MIGHT BE GRANTED
ACROSS CROWN LANDS WITHIN THE YUKON TERRITORY AND THE
NORTHWEST TERRITORIES FOR THE PURPOSE OF THE PROPOSED
MACKENZIE VALLEY PIPELINE

and

IN THE MATTER OF THE SOCIAL, ENVIRONMENTAL AND ECONOMIC
IMPACT REGIONALLY OF THE CONSTRUCTION, OPERATION AND
SUBSEQUENT ABANDONMENT OF THE ABOVE PROPOSED PIPELINE.

(Before the Honourable Mr. Justice Berger, Commissioner)

Yellowknife, N.W.T.

March 12, 1975.

PROCEEDINGS AT INQUIRY

VOLUME XVI

CANADIAN ARCTIC
GAS STUDY LTD.

MAR 18 1975

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APPEARANCES:

Mr. Ian G. Scott, Q.C.	
Mr. Stephen T. Goudge,	
Mr. Alick Ryder and	
Mr. Ian Roland	for Mackenzie Valley Pipeline Enquiry;
Mr. Pierre Genest, Q.C.	
Mr. Jack Marshall,	
Mr. Darryl Carter, and	
Mr. John Steeves	for Canadian Arctic Gas Pipeline Limited;
Mr. Reginald Gibbs Q.C.	
Mr. Alan Hollingworth	for Foothills Pipelines Ltd.;
Mr. Russell Anthony,	
Prof. Alastair Lucas &	
Dr. Andrew Thompson	for Canadian Arctic Resources Committee;
Mr. Glen W. Bell and	
Mr. Gerry Sutton	for Northwest Territories Indian Brotherhood and Metis Association of the Northwest Territories;
Mr. John U. Bayly	for Inuit Tapirisat of Canada and the Committee for Original Peoples' Entitlement;
Mr. Ron Veale and	
Mr. Allan Luke	for Yukon Native Brother- hood;
Mr. Carson H. Templeton	for Environment Protection Board;
Mr. David Reesor	for Northwest Territories Association of Municipali- ties
Mr. Murray Sigler	Northwest Territories Chamber of Commerce

347
M835
Vol. XVI

CANADIAN ARCTIC
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I N D E X

Page

WITNESSES FOR APPLICANT:

Guy Leslie WILLIAMS
John Douglas MOLLARD
David William WATSON
Philip Harvey DAU

- Cross-Examination by Mr. Gibba 1748
- Cross-Examination by Mr. Anthony 1816

Yellowknife, N.W.T.

March 12, 1975.

(PROCEEDINGS RESUMED PURSUANT TO ADJOURNMENT)

MR. GENEST: Mr. Commissioner,

there are a few things that I would like to mention to the Commission, one arising out of the questions raised yesterday with reference to the exhibits filed before the National Energy Board relating to matters such as the tariff and the financial plan. Before I get to that, sir, I should tell you that I should have filed with the Commission yesterday a document which was filed Monday with the Minister of Indian Affairs & Northern Development, which is a supplement to the volume and the whole sections of the application relating to the construction of facilities, which sets out an alternative design of the supply lines leading from Alaska and leading from the Delta Gas sources of supply, the alternative being that the gas from these two sources would be carried through a 42 inch rather than a 48-inch pipeline. That document is now in the clutches of Pacific Western Airlines, and has been there for some time. We expected to receive it here in time for filing yesterday since it was due Monday, in fact. I do not have it. I have a trace on it and as soon as it is available I will file it with you, sir.

Secondly, I should like to advise you, sir, and the Commission counsel and the participants that we have three new reports which have just been completed. I just received them, they are

1 just up here yesterday, which are going to be relevant
2 to the evidence to be given by our geotechnical panel.
3 The titles of the reports are first a report on drain-
4 age and erosion control; second a report entitled:

5 "Draft Interim Report on Results from Frost
6 Effects Study."

7 Third, a reference book of water crossings, Volume 7.
8 There are six volumes previous which have been iden-
9 tified on our lists of documents, and this deals with
10 -- the title is:

11 "Supplemental Hydrology '."

12 Sir, the data and conclusions in these reports will
13 be relied upon by our geotechnical panel. We have
14 copies here, I have only three copies because some
15 are still being printed. We have copies available for
16 inspection and if Commission counsel and any partici-
17 pant wishes to look at them, I ask them to get in
18 touch with Mr. Marshall and make arrangements for
19 their inspection and perhaps we can lend one out at
20 a time if some agreement can be reached.

21 This, sir, is a problem that
22 we are going to continue to face. We look upon your
23 ruling as to production as a continuing obligation.
24 These reports or studies are continuing, we have
25 engineers at work and inevitably as these hearings
26 go on, I wish, as a lawyer, that we could sort of freeze
27 everything, but that's not the way the engineering
28 world works and we will have from time to time new
29 studies, and as soon as they come into being, I consider
30 it my obligation under your rulings to advise the

1 parties and of course the Commission, and it's in
2 discharge of that function that I now wish to advise
3 the parties that we have these new reports that have
4 just been completed.

5 Thirdly, sir, with respect
6 to the requests yesterday that Arctic Gas should file
7 with the Inquiry, as exhibits, the documents that are
8 filed with the National Energy Board, which I did not
9 tender yesterday, I have had an opportunity of consider-
10 ing my position which is, sir, that I do not propose
11 to file at this stage, as exhibits forming part of my
12 case, those documents. The reason is that I question
13 the relevancy of a large part of these documents to
14 the terms of reference of this Inquiry. I have these
15 documents available here. If any party, any participant
16 or Commission counsel wishes to tender them in evidence,
17 I will, of course, stipulate that they were prepared
18 by Arctic Gas and filed before the National Energy
19 Board. But I wish to reserve my rights to argue
20 at the appropriate time, that all or part of the con-
21 tents of these documents are not relevant, and for that
22 reason I do not propose to tender them myself, as an
23 exhibit. However, I have the documents here, if any
24 other party or Commission counsel wishes to tender
25 them.

26 THE COMMISSIONER: Well, Mr.
27 Gibbs?

28 MR. GENEST: Shall I call the
29 panel? Gentlemen, be seated.
30

Messrs. Dau, Williams, Mollard,
Watson -
Cross-Exam by Bibbs

GUY LESLIE WILLIAMS,
JOHN DOUGLAS MOLLARD,
DAVID WILLIAM WATSON,
PHILIP HARVEY DAU, resumed:

CROSS-EXAMINATION BY MR. GIBBS:

Q Mr. Dau, would you arm
yourself with the synopsis of evidence which you had
yesterday when your direct evidence was going in, please?

A I'm sorry, I can't hear
you, sir.

Q Would you have in front
of you the question and answer script from which you
gave evidence yesterday?

1

2

MR. DAU:

3

A Yes.

4

Q Could you open it up

5

at page one, please.

6

Do I understand, Mr. Dau,

7

that with the exception of Dr. Mollard, all of the

8

other three members of this panel either work for or are

9

ex-employees of Williams Brothers?

10

A Yes.

11

Q And who, sir, is Wil-

12

liams Brothers?

13

A Williams Brothers

14

Canada is a consulting engineering firm located in

15

Calgary.

16

Q And who owns Williams

17

Brothers?

18

A It is owned by the

19

Resource Science Corporation of Tulsa, Oklahoma and

20

by Swan Wooster Engineering in Vancouver.

21

Q And in what proportions

22

does that ownership apply?

23

A The is about

24

slightly more than 50% with Swan Wooster , 50.1,

25

I believe. The remainder with Resource Science in

26

Tulsa.

27

Q Williams Brothers is

28

also a very large international engineering and

29

consulting firm, is it not?

30

A The Resource Science

1 Corporation in Tulsa has other subsidiary companies
2 and other ownership in engineering firms, one of them
3 is Williams Brothers Engineering Company in Tulsa
4 which is an international organization.

5 Q And are one or other
6 of those affiliates doing services in Alaska and
7 south of the 49th parallel similar to the
8 services you are performing in Canada?

9 A Yes.

10 Q And so necessarily I
11 take it you maintain liaison with these other arms?

12 A Yes.

13 Q And it follows then that
14 you know a bit of what is happening in the applica-
15 tions for pipeline extensions or construction in
16 Alaska and south of the 49th parallel?

17 A Yes.

18 Q Mr. Dau, you referred
19 to the LORAM group of companies and said
20 yesterday what activities they engaged in -- who are
21 the LORAM group, who makes up the LORAM group?

22 A I am not positive, sir.
23 It is my understanding that it is controlled by the
24 Mannix Interests.

25 Q The Mannix Interests
26 being what?

27 A Well, the Mannix
28 family.

29 Q The Mannix family.

30 A Yes.

1 Q And where do the
2 Mannix family reside?

3 A In Calgary, I understand.

4 Q Are you aware of whether
5 or not the ownership interest in Loram Group are
6 also shared with persons or corporations in the
7 United States?

8 A I am not aware of that,
9 sir.

10 Q Another of the partners
11 in your group is Shawinigan Power?

12 A Shawinigan Engineering Co.

13 Q Shawinigan Engineering.
14 Do you know who owns Shawinigan Engineering?

15 A I understand that it
16 is owned by primarily the employees of the company.
17 I do not have any information as to how that is split
18 up.

19 Q Montreal Engineering,
20 do you know who owns Montreal Engineering?

21 A I believe that it is
22 a very similar arrangement, sir.

23 Q And who are R.M. Hardy
24 and Associates?

25 A They are a group of --
26 consulting group specializing in geotechnical and
27 materials engineering based in Edmonton.

28 Q And all of this group,
29 sir, makes up Northern Engineering Services?

30 A Yes.

1 Q And does Northern
2 Engineering Services have a share issue to each of
3 this group of participants?

4 A Yes,

5 Q Then who is the largest
6 shareholder?

7 A Williams Brothers Cana-
8 da.

9 Q And what percentage of
10 shares do they own?

11 A 50%.

12 Q And then do you look
13 sir, upon the parent corporation of Williams
14 Brothers Canada Limited as the parent corporation
15 of Northern Engineering services?

16 A No.

17 Q Does your direction
18 come from the parent corporation, to Williams
19 Brothers Canada Limited?

20 A No, sir, it comes fo
21 from the Board of Directors of Northern Engineering.

22 Q And of that Board
23 how many are appointees from Williams Brothers
24 Canada?

25 MR. GENEST: Mr. Commissioner,
26 do not
27 I/want to stop my friend, but the relevance of this
28 kind of question escapes me completely.

29 MR. GIBBS: Well, sir, we
30 heard all day yesterday all about their academic
qualifications and publications and it seemed to me

1 relevant to know really who they are in fact and
2 who they answer to as well as what their qualifications
3 are. It is not of that much importance to me if
4 my friend thinks it should not be pursued and if
5 you do sir, I will abide by your direction.

6 THE COMMISSIONER: WELL, I
7 have no doubt you will abide by my direction -- I
8 do not want to cut you off if this is all getting us
9 somewhere. You are always entitled to cross-examine
10 witnesses relating to questions of their credibility
11 and I had assumed that that was what we were getting
12 at here, but if it is something else and I have not
13 understood it, please enlighten me.
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Dau, Williams, Mollard,
Watson
Cross-Exam by Gibbs

Q Well, to put it

simply, sir, what I am trying to find out is whether this group of engineering service people really take directions from an American organization, because in my view if that is so, then that may have some effect on why some of the pipe has been located where it is, particularly west of Travaillant Lake.

THE COMMISSIONER: Well, these witnesses are here to discuss the route of the pipeline, why the route that is urged upon this Inquiry and through ^{it} the Minister has been chosen, and if these questions relate to the reason why that route was chosen, I think they're relevant; but anything further you wish to say about this, Mr. Genest?

MR. GENEST: No sir,

I recognize that friend is entitled to cross-examine his credibility, certainly. I just don't see where this long examination into the structure, corporate structure of these various companies, where it is leading us. My friend assures me it's directed to credibility, I accept that.

THE COMMISSIONER: Well, he's going a little farther than that. He's saying it bears on some of the reasons behind the choice of the route that is urged by Arctic Gas, and that, it seems to me, is another matter and maybe of some consequence. Carry on, Mr. Gibbs.

MR. SCOTT: Mr. Commissioner, before he does, this isn't a complaint that I would have urged, but I've been advised that the members

Messrs. Dau, Williams, Mollard,
Watson
Cross-Exam by Gibbs

1 of the press in the audience can't hear Mr. Gibbs.

2 MR. GENEST: That's a disaster
3 for him.

4 MR. GIBBS: There's not much
5 I can do about the microphone system; they should be
6 improved.

7 MR. SCOTT: Apparently if
8 they're improved any more there is feed-back and re-
9 verberation of some type. Perhaps Mr. Gibbs could
10 speak just a little louder.

11 MR. GIBBS: Mr. Dau, when
12 one looks at Northern Engineering Services and tries
13 to trace where the ultimate direction comes from, is
14 it from a United States corporation?

15 A It is not.

16 Q On page 1 of the
17 prepared evidence you start off by saying you were
18 retained in 1967 by some of the present members of
19 the Arctic Gas study group to investigate the feasi-
20 bility of a natural gas pipeline. By whom specifically
21 were you retained in 1967?

22 A Trans-Canada Pipeline,
23 Michigan, Wisconsin Pipeline Company in Detroit, and
24 Natural Gas Pipeline Company in Chicago.

25 Q And did the investiga-
26 tion of feasibility include route selection?

27 A I'm sorry, did it
28 include --

29 Q Route selection.

30 A Yes.

Dau, Williams, Mollard, Watson
Cross-Exam by Gibbs

1 Q What was the route
2 then selected from the areas you were then looking at?

3 A Essentially a direct
4 route, a route as direct as possible from the Fort
5 Liard area to Emerson, Manitoba, which is south of
6 Winnipeg.

7 Q Did you get so far as
8 to consider pipe sizes in that route selection?

9 A Yes, we investigated
10 several sizes, and if my memory is correct, they
11 ranged from 30 to 42, and I believe that the volumes
12 we were looking at at that time, the selected size
13 was 36-inch.

14 Q And in the early part
15 of that answer you say you were looking into feasi-
16 bility of a natural gas pipeline from potential
17 producing areas of Northwest Canada to the market
18 area in the Great Lakes of Canada and United States.
19 Can you be more specific about what market areas, in
20 1967, the pipeline intended to serve?

21 A No, I cannot. These
22 were the instructions we received for delivery to
23 Emerson.

24 Q Then you go on and say:
25 "In 1969 discussions were held with producing
26 companies."
27 Which companies?

28 A At that time it was the
29 Exxon Corporation, now known as the Exxon Corporation;
30 Atlantic Richfield, and Ohio D.P. in Alaska.

Dau, Williams, Mollard, Watson
Cross-Exam by Gibbs

1 Q It was just the Alaskan
2 producing companies?

3 A Yes, sir, just the
4 Alaskan producing companies.

5 Q And on whose initiative
6 did this take place, was it Williams Brothers or the
7 Alaska producers?

8 A It was between the
9 participants, as I understand, it was between Trans-
10 Canada and Michigan, Wisconsin Natural Gas Pipeline
11 and the three producing companies. We had no role to
12 play in getting them together.

13 Q And you have been
14 working continuously since that time, 1969, on this
15 feasibility -- pipeline feasibility?

16 A Yes.

17 Q Would you turn to page
18 3 of your prepared evidence? The answer at the top
19 of the page where you say that you're providing
20 these services necessary to determine the feasibility
21 of an appropriate and efficient method of constructing
22 a pipeline. Does your responsibility not extend then
23 to the operating of the pipeline?

24 A It only extends into the
25 investigations into the feasibility of operating the
26 pipeline at this stage. We have no role in the
27 ultimate operation of the pipeline.

28 Q And speaking of feasi-
29 bility, sir, which you have just done and which you
30 did in your answer yesterday, in using that word

Dau, Williams, Mollard, Watson
Cross-Exam by Gibbs

1 do you intend physical feasibility? Or economic
2 feasibility? Or financial feasibility? Or all three?

3 A No, we have no role
4 within the financial feasibility. Our role is primarily
5 in the technical area. Northern Engineering Services
6 is not providing the expertise necessary in financing.
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1 Q Then it would fall
2 within what I described as the physical part and I
3 presume you have some economic input as well.

4 A Yes, in the sense
5 of capital and operating costs.

6 Q Mr. Dau, who made the
7 decision that the prime route you now propose is
8 physically and economically feasible, did you?

9 A Yes, that -- Yes,
10 as Northern Engineering.

11 Q And didn't your client
12 have some voice in that determination also?

13 A Yes, he accepted our
14 recommendations.

15 Q Will you turn now to
16 page 7 of your prepared evidence, please?

17 And those eight factors,
18 plus the economic shortest distance were what went into
19 your determination of feasibility?

20 Is that correct?

21 A Plus cost information,
22 yes, that type of --

23 Q Yes, --

24 Mr. Dau, I want to suggest
25 to you that there should be added in, 9 and 10 and
26 as throughout the cross-examination I will be coming
27 back to the 9 and 10. I wonder if you would write them
28 down as I tell them to you.

29 I suggest to you that number
30 9 on that list ought to be ownership and control of the

1 operating company and that number 10 should be poli-
2 tical and regulatory factors.

3 Now --

4 MR. GENEST: Mr. Commissioner,
5 I object to that question.

6 As an engineering panel
7 they are discussing engineering matters and my friend
8 is quite obviously inserting political factors
9 which are not within the domain of these engineers.

10 MR. GIBBS: I propose to
11 go now into a series of questions which I believe will
12 demonstrate that the route was chosen on the basis
13 of one of those two factors and not on the shortest
14 distance between two points principle at the top
15 of page

16 THE COMMISSIONER: Mr. Gibbs
17 is saying, Mr. Genest, as I understand him, that
18 he proposes to seek to show, in questioning these
19 witnesses, that in fact other considerations beyond
20 those named at page seven were the dominant considera-
21 tions --

22 MR. GENEST: I think that
23 is proper, sir.

24 THE COMMISSIONER: Carry
25 on, then.

26 MR. GIBBS:

27 Q Now, sir, at the top
28 of page seven, Mr. Dau, you make the principle that
29 with all factors being equal, the most economic pipeline
30 route was the shortest distance between the source

1 of supply and the point of delivery. That is the
2 ideal situation.

3 A Yes.

4 Q And when you say that, sir,
5 whose economics are the test? Is it the economics
6 of the gas purchaser or the gas producer or the
7 operator of the pipeline?

8 A It would be the operator
9 of the pipeline.

10 Q And does not the cost
11 of service which will ultimately be paid by the
12 consumer, is that not an economic input in determining
13 the short distance, is that not a guiding factor?

14 A I think that they are
15 the same, sir, the most economical pipeline provides
16 the lowest cost of service.

17 Q Now, sir, in the begin-
18 ning, back in 1969 when you started these feasibility
19 studies, in accordance with this shortest distance
20 principle, what point of delivery were you looking
21 at?

22 A Yes, the initial
23 studies were based on deliveries to Trans-Canada
24 pipelines at their compressor station number 49, near
25 Brandon and a continuation to Emerson, Manitoba.
26 These are the initial studies at two delivery points,
27 one at Trans-Canada and one at Emerson.

28 Q Could the witness be
29 provided with a copy of Exhibit 60, please. Entitled
30 "Alternative Corridor Drawing," Sub-section 14 (e) 1,

1 10. Immediately inside the front cover is a
2 pull out map, drawing 402041014. Do you have that?

3 THE COMMISSIONER: Excuse
4 me, Mr. Gibbs, should I be looking at this too?
5 I think that I should be and -- I

6 MR. GIBBS: Exhibit 60 entitled
7 "Alternative Corridor Drawing." -- and the pull-out
8 map immediately inside the front page.

9 THE COMMISSIONER: Carry
10 on, yes.

11 MR. GIBBS:

12 Q Mr. Dau, that first,
13 most economic, most shortest distance route is shown
14 on that map by a dotted line, is that correct?

15 A Yes.

16 Q And that dotted line
17 for the record, departs from your present prime
18 route at about Fort Simpson.

19 A Yes.

20 Q And proceeds southeaster-
21 ly to a corner of the Cold Lake Bombing Range --

22 A Yes --

23 Q And then almost in a
24 straight line to Emerson, Manitoba.

25 A Yes.

26 Q And at that time, sir,
27 that was your advice that that was the most economi-
28 cally feasible route to get gas to Trans-Canada
29 Pipelines and down into the United States?

30 A Yes.

1 Q And, sir, at that time
2 in 1969, did the connecting portion shown running
3 southwest from the Cold Lake Bombing Range to
4 Kingsgate, British Columbia , was that in the plans
5 at that time also?

Dau, Williams, Mollard, Watson
Cross-Exam by Gibbs

1 A That was a little later.
2 I'm not sure of the exact timing of it.

3 Q Well, in sequence in any
4 event, Mr. Dau, you had what was then called the
5 gun-barrel route.

6 A Not by me.

7 Q By others, by our
8 friends back here.

9 A Yes.

10 Q And then there came to
11 join the gun-barrel route, a link going to the south-
12 west, to Kingsgate.

13 A Yes.

14 Q And that came about
15 because of the joining of your clients as sponsors
16 California Utilities.

17 A Yes.

18 Q Now, sir, was there not
19 another reason for that gun-barrel route, and that
20 was that by that means the gas was outside of Canada
21 in the shortest, quickest time?

22 A I don't understand that,
23 I don't think so.

24 Q All right. Then, sir,
25 at some later stage the gun-barrel route moved to the
26 west, did it not, not to where the present prime
27 route is but at -- to an intermediate point?

28 A There were a series of
29 studies that moved that point near the south-west
30 corner of the Liard Weapon Range, moved it

Dau, Williams, Mollard, Watson
Cross-Exam by Gibbs

1 in a series of locations further west. We were
2 examining alternatives.

3 Q Yes sir, and those
4 series of moves further west had nothing to do with
5 any of the eight factors in your evidence, did they?
6 That was moved west by reason of the give and take
7 of the sponsorship of Canadian Arctic Gas.

8 A No, I disagree. The
9 work we did in those studies was based on the amount
10 of gas that would flow either east or west. We were
11 asked to determine the efficient configuration at
12 different splits of gas going east and west.

13 Q And as the split of
14 gas to the west was increased, that pulled the gun-
15 barrel to the west.

16 A That is correct.

17 Q And do you know the
18 reason behind changing that split of gas between east
19 and west?

20 A No sir.

21 Q You just did as you
22 were told.

23 A I did as I was told.

24 Q At the ^{beginning} you were told it
25 would go 20% west, and so that moved it a little bit,
26 and then it increased finally to 50% west.

27 A I believe we selected
28 both those -- we were given both those percentages,
29 yes,

30 Q Well then, Mr. Dau,

Dau, Williams, Mollard, Watson
Cross-Exam by Gibbs

1 I invite you to agree with me that the change from
2 the original gun-barrel route to the present prime
3 route was not due to any of the eight factors that
4 you have on page 7 of your prepared evidence, but due
5 to what I call, what I gave you as the ninth factor,
6 the ownership and control of the operating company.
7 They made that decision.

8 A Only in the sense that
9 we were directed or we were advised of delivery
10 points, and the delivery points, which have changed
11 now, were at the Alberta-B.C. border, at Kingsgate,
12 at Empress, and at Monchy.

13 Q Yes sir, and as that
14 line was pulled west by this California demand, didn't
15 it necessarily start -- depart from your most economic
16 shortest distance, because you're pulling it now into
17 the two long sides of the triangle, whereas previously
18 it was the hypotenuse of the triangle?

19 MR. GENEST: That is a mis-
20 leading question in my respectful submission, Mr.
21 Commissioner, because the evidence of the witness
22 which he said yesterday, clearly states that he starts
23 from the shortest distance between the source of
24 supply and the point of delivery, and it's from that
25 base that he makes adjustments on those nine factors,
26 and I submit that my friend's question is in the
27 class of question of "When did you stop beating your
28 wife?" It assumes something that the witness has not
29 agreed to, and I object to the form of it.

30 MR. GIBBS: Q Well, sir, he

Dau, Williams, Mollard, Watson
Cross-Exam by Gibbs

1 began by telling me that the shortest distance to
2 serve the market was almost a direct line from Fort
3 Simpson to Brandon and Emerson. Now I'm merely asking
4 him if he is departing from the shortest distance as
5 that line is pulled west from the prime route?

6 A It departs from the
7 shortest distance between Fort Simpson and Brandon,
8 but Brandon is not the only delivery point.

9 Q No sir, but it lengthens
10 the distance from Fort Simpson to Brandon, the prime
11 route, considerably over the original gun-barrel route?

12 A Yes.

13 Q And the person who pays
14 for that extension, that length of line, is really the
15 Canadian consumer east of Winnipeg, isn't it?

16 A I don't know, I'm not
17 familiar with the tariff arrangements that are proposed.

18 Q Well, sir, if you look
19 at your map, surely you're travelling a greater distance
20 from Fort Simpson to Winnipeg on the prime route than
21 you were on the gun-barrel route.

22 A Yes.

23 Q And if you take it that
24 you pay for transportation, then doesn't it follow,
25 without knowing what the tariffs are that by the
26 longer route the Eastern Canadian consumer is paying
27 a greater cost? Doesn't that follow?

28 A That does not necessar-
29 ily follow, sir. It doesn't follow because the
30 portion of the line from Fort Simpson to Caroline is

Dau, Williams, Mollard, Watson
Cross-Exam by Gibbs

1 presumably carrying the full amount of gas. If there
2 is a split from Caroline going to Emerson and Monchy
3 and some going to Kingsgate, the -- presumably they
4 share that main stem. Now, if the gas or some portion
5 of the gas is going to -- east of Winnipeg, it may
6 well be that the most expensive way of moving that
7 would be to have the direct line as shown here, which
8 would be much smaller, from Fort Simpson to essentially
9 Brandon. What I'm saying is that if half of the volume
10 of the gas --

11 THE COMMISSIONER: Brandon is
12 where they meet with Trans-Canada?

13 A That's the inter-change
14 with the Trans-Canada system, sir. It's near the Town
15 of Brandon. What I'm trying to say is that half of
16 the gas is going east of Brandon, and half of the gas
17 was being delivered south of Caroline, that to have
18 a system that essentially started at Fort Simpson with
19 one line that went to Brandon, and another system that
20 starts at Fort Simpson and goes down towards Caroline,
21 maybe more expensive, in fact I suspect it would be
22 more expensive, than sharing those facilities.

23 MR. GIBBS: Q Well, yes sir,
24 but on your map in Exhibit 60 you show a connection
25 running south-west from Cold Lake to take the gas
26 south-west, so at that time you were talking of the
27 shortest distance from Fort Simpson to Brandon, and
28 then a link to take gas south-west to those California
29 consumers, and you then had a pipe size which would
30 accomplish that.

Dau, Williams, Mollard, Watson
Cross-Exam by Gibbs

1 A Yes.

2 Q So when you move the
3 line west, don't you merely shorten the California
4 intended portion, and lengthen the Canadian intended
5 portion?

6 A At that stage, we were
7 instructed to consider delivery points to Trans-Canada
8 at Empress, and delivery location for Eastern Canada
9 and our instructions was moved from Brandon to Empress.

10 Q Yes. Now, we get to that
11 point then, sir, that I wanted to get to, that the
12 location then was determined not by your 8 factors
13 but by the ownership of the operating company, and it
14 no longer was the shortest distance between two points
15 but something different.

16 A I have to go back to the
17 top of page 7,

18 "The shortest distance between the source of
19 supply and the point of delivery,"
20 and what I'm saying, sir, is the point of delivery that
21 we were given moved from Brandon to Empress.

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Dau, Williams, Mollard, Watson
Cross-Exam by Gibbs

1 This system that we're describing on this dash line
2 does not allow delivery to Empress.

3 Q And the end result of
4 the choice of that new point of delivery was to lengthen
5 the distance of transportation of the gas to consumers
6 east of Winnipeg.

7 A It travels a further
8 distance, yes. No question about that, sir.

9 Q And you will agree that
10 it is not any of your eight factors that brought that
11 about.

12 A That is correct.

13 Q Now, sir, keeping those
14 eight factors in front of you, plus my 9 and 10, can
15 we now consider the Alaska-Yukon section? On the same
16 route drawing, and for the record, Mr. Dau, can we
17 agree that the portion west of Travaillant Lake is not
18 required for Canadian consumers at all? That's there
19 purely to serve U.S. consumers.

20 A That's my understanding
21 sir, yes.

22 Q And therefore, Mr. Dau,
23 any economies that may be effected between the
24 coastal route and the interior route are economies
25 which will flow to the benefit of the U.S. consumer,
26 not the Canadian consumer.

27 A I suspect, sir, that
28 that -- I would have to be aware of the tariff arrange-
29 ments before I could agree with you. I don't know what
30 arrangements are being made in sharing costs are

Dau, Williams, Mollard, Watson
Cross-Exam by Gibbs

1 concerned.

2 Q Well, sir, it would seem
3 like common sense that if Canadians don't need it they
4 won't be paying for it. But you don't know, the re-
5 verse may be the case, that Canadians may be paying
6 for part of that even though they're not using it.

7 A I just don't know.

8 Q And Mr. Dau, in line
9 with your shortest distance principle, is it still
10 your position that the economy dictates the -- what
11 you call the prime route?

12 A Yes.

13 Q And what led you to
14 propose as an alternative, the interior route?

15 A To pass south of the
16 Arctic Wildlife Refuge in Alaska.

17 Q That was to deal with
18 a United States concern, that is in Alaska.

19 A Yes.

20 Q And that's, I suppose,
21 your factor No. 6.

22 A Yes, that would be right.

23 Q And so the \$500 million
24 that you mentioned to the Commissioner yesterday
25 really is an expenditure which may be incurred to meet
26 an objection from United States authorities.

27 A Yes.

28 Q And where did the cross-
29 delta route originate? Who initiated that?

30 A That's been under

Dau, Williams, Mollard, Watson
Cross-Exam by Gibbs

1 consideration or was under consideration several
2 years ago and at that time we suspected that there
3 were serious environmental concerns in that particular
4 area; about a year ago, it's my understanding that
5 after many studies by the producers in the area, it
6 became apparent that those concerns were not as great.
7 At that time we started some detailed field investi-
8 gations, particularly with respect to the channels
9 and Shallow Bay. These studies are continuing. We
10 had a program on earlier this winter and it's my
11 understanding that the environmental concerns are not
12 almost in balance, I guess, is the way to say it, with
13 the prime route. In other words, it's not worse envir-
14 onmentally. We've concluded that it is feasible
15 technically and have prepared some documentation which
16 I understand is under consideration for being filed.

17 Q And is it less expensive
18 than the prime route?

19 A Yes sir.

20 Q And what range of savings
21 would that be?

22 A In the order of \$100
23 million.

24 Q And that, of course,
25 because that portion is not needed by Canadian users,
26 that would flow to the benefit ultimately of U.S.
27 consumers.

28 A Not completely, no.

29 Q Is there any difference
30 Mr. Dau, in either of those three routes, the interior,

Dau, Williams, Mollard, Watson
Cross-Exam by Gibbs

1 the coastal and the cross-delta, in ease of access
2 for construction and future maintenance and operation?

3 A Yes, there's a difference.
4 It would be my view that cross-delta would probably
5 be favored because it has less miles of pipeline route.
6 There are no unusual access problems on that route.

7 Q Mr. Dau, yesterday you
8 mentioned the \$500 million difference, which I looked
9 on Exhibit 59 and I find that it's more like 525
10 million, but I suppose 25 million in this kind of project is
11 petty cash.

12 A I looked that up too,
13 sir, and found that I'd missed it by \$24 1/2 million.

14 Q And how much of that
15 \$500 million is in Canada, and how much in Alaska?

16 A I don't have that
17 information here, sir.

18 Q Is that information
19 available to you?

20 MR. GENEST: All I
21 can do is look into it, sir. Does the Commissioner
22 want to have it?

23 THE COMMISSIONER: It seems
24 to me to be pertinent because if it's in Alaska
25 that's the financial obligation of someone other
26 than this applicant. I think if you can
27 supply us with that information, you should. I'd
28 like to have it.

29 MR. GENEST: Perhaps these
30 questions will arise from time to time. Might I

Dau, Williams, Mollard, Watson
Cross-Exam by Gibbs

1 just throw out the suggestion, to which I expect no
2 reply after mature consideration, but we perhaps
3 attempt to provide this in letter form; if any party
4 is not satisfied, the witness will, of course, have
5 to be recalled. But if that would be satisfactory we
6 could put it in written form in the first place and
7 that may satisfy the requirements.

8 MR. GIBBS: I think, sir, it
9 might be preferential if counsel read it so it gets
10 into the record for all then to read, rather than
11 just to furnish the participants.

12 MR. GENEST: As an exhibit,
13 is my suggestion, if that's satisfactory.

14 THE COMMISSIONER: It must
15 be possible for Arctic Gas to say what proportion of
16 the \$500 million expenditure is attributable to construction
17 on / ^{the} U.S. side of the Alaska-Yukon border, and on the
18 Canadian side. That cannot be a matter --

19 MR. GENEST: We can probably
20 get that overnight. I'm just thinking ahead too
21 much, which is perhaps a defect.

22 MR. GIBBS: Q Mr. Dau, one
23 of the influences on the choice between coastal route
24 and interior route is going to be the Federal Power
25 Commission, is it not?

26 A Yes.

27 Q And presumably you
28 could have the Federal Power Commission approving
29 the coastal route and the Canadian authorities the
30 interior route., for different reasons.

Dau, Williams, Mollard, Watson
Cross-Exam by Gibbs

1 A Presumably.

2 Q Yes, and Mr. Dau, would
3 it be then your view that the ultimate decision of
4 which route is going to come about will really come
5 from the Federal Power Commission, will it not?
6 Perhaps I can --

7 A If the coastal route
8 were rejected and not approved by U.S. authorities,
9 it's very obvious, sir, that the interior route in
10 Canada would have to be used. Am I responding? I
11 don't --

12 Q Well, sir, maybe I can
13 get at it this way. It's the position of your client
14 -- and I take it you share this view -- that the
15 Mackenzie Delta gas can only get to Canadian markets
16 if it is mingled with Alaska gas, piggy-backed or
17 whatever the exact term is.

18 A Yes.

19 Q And it therefore
20 follows that if the Alaska gas isn't available, there
21 is no Canadian Arctic Gas Pipeline project because
22 it's not economic, in your view, to carry delta gas
23 alone.

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1 A As designed, that is cor-
2 rect.

3 Q Yes. Well, then, sir,
4 is there another design which makes it economic
5 to carry Mackenzie Delta gas alone?

6 A This pipeline that we
7 have designed is based on some throughput levels that
8 we were given, which reach, for design purposes, a level
9 of four and a half million feet a day in the fifth
10 operating year. If you use that system, as designed,
11 from the Delta south and you remove the Alaskan gas
12 of two and a quarter billion feet a day so that you
13 have only got two and a quarter billion feet a day
14 left, you would -- well, I can assure you you would not
15 have exactly the same design south of the Delta.

16 - Q So, yes, sir, I think that
17 we all agree on that, but is there a design which you
18 have looked at which could carry Mackenzie Delta
19 gas alone economically to Canadian markets?

20 A There is not.

21 Q There is not.

22 A Not that one --

23 Q So we are back to the
24 point where we have to share with Alaska gas, the
25 transportation system according to your views?

26 A Yes.

27 Q And so then, sir, without
28 the Alaska gas there is no Canadian Arctic Gas project?

29 A Well, that is --

30 Q Well, does it not

1 follow?

2 A I do not know -- that
3 is a decision for Canadian Arctic Gas. Not for me.

4 Q But I thought that we
5 had just gone around in that circle and you ended
6 up telling me that you did not know of a design that
7 could bring Mackenzie Delta gas alone economically
8 to Canadian markets.

9 A No, I did not say
10 that, sir. I said that I had not done one. We have
11 not worked on a design for Delta gas only.

12 Q Then you do not know of
13 a design which could bring it economically?

14 A Not specifically.

15 Q No, and do you
16 share the position taken publicly by the President
17 of Canadian Arctic Gas that you must move those
18 two gas streams together for it to be economical?

19 A I can only say that
20 it is much more economical by moving the large
21 volume. I have not gone into the financial feasibility
22 and the tariffs and all the rest of it. I share
23 that view that it is the most economic and I am
24 not trying to argue with you --

25 Q No, I am trying to
26 invite you to say with me that we do not need the
27 Alaska gas. I wonder if we are getting a little
28 closer to that point.

29 A No, I am --

30 Q In your view we must

1 have that Alaska gas into the system?

2 A Yes.

3 Q Well, that is clear.

4 Then sir, if the only way
5 we can get Alaska gas into the system is by a route
6 approved by the Federal Power Commission, then don't
7 we have to adopt that same route in Canada? Because
8 if we do not we will not have the Alaska gas and we
9 will not have --

10 A That is correct,
11 yes.

12 Q So then you agree with me
13 that with all due respect to the Commissioner, that
14 the ultimate decision on that interior or coastal
15 route rests with the Federal Power Commission?

16 A Yes.

17 Q Mr. Dau, could we
18 now talk a little bit about the Fort Simpson route
19 amendment which came in yesterday and would you
20 have in front of you exhibit 66, please.

21 66, sir, is entitled "Lo-
22 cation of Facilities, Design and Capacity of Facili-
23 ties, Construction Plan, Environmental Statement
24 Exhibits in Support of an Amendment". It was a new
25 volume yesterday.

26 THE COMMISSIONER: Exhibit
27 66, Miss Hutchinson? Could I have it please.

28 MR. GIBBS: What I wanted
29 to refer the witness to, sir, in exhibit 66 was the
30 pullout map, but I note that the separate map which

1 was distributed is more clear on the points that
2 I want to make, so perhaps the witness could have one
3 of these separate maps. I think that it is the
4 same one that is in the book, but it is easier to
5 read. Do you have one of these separate ones?

6 A I do not, no.

7 Q Now, sir, what I want
8 you to look at specifically is an area called Ebbutt
9 Hills --

10 A Excuse me, sir.
11 could I get the number of the drawing that you
12 are looking at -- is it 1B 0231-1006?

13 Q No, sir, I am looking
14 at map 18-0231-1006.

15 MR. GENEST: That is the
16 map, Mr. Gibbs, that we sent at some stage to the
17 participants?

18 MR. GIBBS: Yes. --

19 MR. GENEST: I do not know
20 if the Commissioner has it.

21 MR. HOLLINGWORTH: It was
22 distributed yesterday by Mr. Waddell.

23 MR. SCOTT: Where is it in
24 the book? Now I have three copies.

25 MR. GIBBS: Maybe I could
26 have one back, please.

27 Q Particularly I want
28 to direct your attention, Mr. Dau, to an area called
29 Ebbutt Hills --

30 A Yes --

1 Q -- which is immediately
2 above the scale marking on the bottom of the map --

3 A Yes --

4 Q And it would look to
5 me, sir, that on the southeast side, as you descend
6 from the Ebbutt Hills you have a very, very sharp
7 drop off indeed, almost approaching perpendicular.

8 A Oh, no -- no way.

9 Q No, I see.

10 Is there anywhere in the
11 Delta, in the Mackenzie Valley line where you have a
12 sharper drop off than the edge of those Ebbutt Hills?

13 Ebbutt Hills. E.B.B.U.T.T.

14 H.I.L.L.S. Ebbutt Hills.

15 A I am sure that there are
16 many locations that are not as high but are much
17 steeper, yes.

18 Q But this is a drop off, sir,
19 of -- from 2100 feet to something around 600 feet in
20 about four miles.

21 A That is correct.

22 Q Yes.

23 And on the -- and do you, sir,
24 contemplate any problems with the terrain or disturbance
25 sensitivity in going over, or going down the south side
26 of the Ebbutt Hills?

27 A We recognize that some
28 special precautions will have to be taken in such an
29 area. We do not think that it is as steep as your
30 inference, sir. In the short distance on this particular

1 map the -- we go from an elevation of about 2000 feet
2 down to a thousand feet which is a thousand feet in
3 elevation in a distance of -- I cannot scale it -- I
4 would say, two miles, something on that order.

5 Q Well, sir, maybe it is
6 better illustrated on your alignment sheets.
7 It looks pretty steep to me on those. Now, would you
8 like to refresh your memory by looking at
9 the alignment sheets?

10 A Fine.

11 Q They are entitled
12 "Canadian Arctic Gas Pipeline Limited Amendment to
13 Alignment Sheets -- Pipeline Routing in the Vicinity
14 of Fort Simpson Profile". The profile, sir, is
15 on drawing number IN 0200 1006.

16 A Yes, I have it, sir.

17 Q And the profile is what
18 is at the top of the photographic strip --

19 A Yes, yes.

20 Q And the first of the
21 squares shows a sharp curve downwards --

22 A Yes.

23 Q And the next square shows
24 a continuation of that curve?

25 A Yes.

26 Q And it is beside it
27 because there was not room to put it underneath?

28 A Yes.

29 Q And does not that, sir
30 show that you start of an elevation of over 2100 feet

Dau. Williams
Mollard, Watson
Cross-Exam by Gibbs

1 and you drop, what looks to be pretty well vertically,
2 down to about a thousand feet?

3 A The horizontal and ver-
4 tical components of this scale are in a ratio of
5 about ten to one. I trust that you understand that -

6 Q No, I did not understand
7 -- so I cannot look at this and accept it for what
8 it tells me, tells my eyes, it is wrong --

9 A No.

10 Q I have to use a different
11 scale.

12 A That is not a natural
13 scale. For instance, if you take that second little
14 rectangle that you referred to, the base -- on
15 true scale -- the base of that rectangle would
16 be ten times that length.

17 THE COMMISSIONER: The
18 angle would not be as steep, is that the point?

19 A Yes, sir, it would
20 be one-tenth of it.

21 MR. GIBBS:

22 Q Is that true of the
23 profiles in all of your alignment sheets?

24 A Yes, on all of them.

25 Q So we just cannot look
26 and take what is shown there as fact because it
27 is not fact --

28 A No, it is fact.

29 Q It is fact, but distorted
30 by the scale?

A Right.

Dau, Williams, Mollard, Watson
Cross-Exam by Gibbs

1 Q You do have a concern
2 in your company, sir, about the disturbance sensitiv-
3 ity of Ebbutt Hills?

4 A Yes, we've had Dr.
5 Mollard look at this one in particular, perhaps he
6 could respond to this concern.

7 Q Yes.

8 WITNESS MOLLARD: Do you want
9 me to respond?

10 Q Not yet, Dr. Mollard,
11 I'm not quite ready for you yet.

12 MR. GENEST: Mr. Commissioner,
13 I don't want to excessively technical again, but this
14 is a panel. A question has been asked one of the
15 members of the panel. I suggest, sir, that to be
16 orderly about it, any member of the panel that has
17 the information should go on and give the response.

18 THE COMMISSIONER: I do wish
19 to hear what Dr. Mollard has to say about the Ebbutt
20 Hills, but I didn't wish it to interfere with Mr.
21 Gibbs, and if he doesn't bring us back to Dr. Mollard,
22 remind me and I'll ask him for his response.

23 MR. GIBBS: I merely wanted
24 to draw Dr. Mollard's attention to something that is
25 in some of the material filed by the applicant, but
26 I seem to have lost my reference so perhaps he can
27 respond and then I'll draw his attention to it
28 afterwards, as my friend is anxious to hear him.

29 WITNESS MOLLARD: Well, my
30 understanding of the thing, we examined the area,

Dau, Williams, Mollard, Watson
Cross-Exam by Gibbs

1 of course, quite a long time after we examined the
2 route that went west of Fort Simpson. Initially we
3 looked at just the window shown on the alignment
4 sheets, and then I had occasion to look at the higher
5 level of the whole Ebbutt Hills area in effect, all
6 the way from the river between two mountains, or I
7 should say Willow Lake River, essentially to east of
8 Fort Simpson to get an overview, as I was discussing
9 yesterday, of the general terrain.

10 Now my understanding is that
11 without getting into detail -- if you want to, I can
12 discuss the alignment sheet -- that the terrain there
13 is, of course, higher but it's glaciated, bedrock, and
14 we've discussed the engineering geology of the
15 area and it's my understanding that further work might
16 be done, of course, on that route, if it goes ahead.
17 As you know, we have a lot of drilling on the other
18 routes, and I don't think we have too much drilling
19 on this route. Is that correct?

20 So as to the route and the
21 various alternatives which I have looked at several
22 going across there, I can't see anything in the
23 aerial photographs that would throw out, definitely,
24 that route without examining it in more detail on the
25 ground by doing some bore hole work. In other words,
26 on the east slope, relatively speaking of course,
27 compared to the whole route, it is a good deal steeper
28 than a lot of the route. I think from my recollection
29 there are other places that are steeper along the
30 route, but -- and there are instabilities on the

Dau, Williams, Mollard, Watson
Cross-Exam by Gibbs

1 sides of the Ebbutt Hills, but I don't think that where
2 the route is located that there is any instability
3 that's of a character that would justify moving the
4 route, before it was disproved from field work.

5 Q At this point in time
6 then you're not concerned with going over the Ebbutt
7 Hills?

8 A No, I think that ⁱⁿmy
9 examination of it, and I looked at it in quite a
10 bit of detail, I think it's quite a uniform slope
11 there, right where the best route at that location.
12 My preference is, you might move it a few feet this
13 way and that way, in other words I'd be inclined to
14 select what I think is the flattest route through
15 there, but on this scale of map I don't think it
16 would change materially.

17 There are other routes to
18 the north slightly longer, but they have a somewhat
19 flatter grade but coming back, I think the somewhat
20 flatter gradient areas, for example only a few miles
21 to the north, wouldn't increase the length, that
22 one really can't look at those seriously without
23 disproving this route, and to me it can't be disproved
24 and thrown out without some bore hole data because
25 there is no signs of recent instability right along
26 the right-of-way.

27 Q You see, Dr. Mollard,
28 I thought that the applicant was concerned about the
29 Ebbutt Hills when I read part of Exhibit 66, which I
30 wanted to find to help you but my friend didn't want

Dau, Williams, Mollard, Watson
Cross-Exam by Gibbs

1 me to help you. In Exhibit 66 there is a tab 14-D,
2 "Environmental Statement."

3 Could the witness have that in front of him? Right
4 at the bottom of the page 16 under the tab,
5 "Environmental Statement"

6 I read that as far as someone in the applicant's group
7 is concerned, " along the east Fort Simpson routing the
8 Ebbutt and Red Knife Hills are noted as being parti-
9 cularly sensitive to disturbance, thus requiring
10 special erosion control measures.

11 Now are you -- I understand
12 you now to say that you're not far enough along to be
13 concerned about this?

14 A Well, in answer to that,
15 I would I think agree in the sense that it certainly is
16 a locally much steeper slope, and I think obviously
17 it will have to be looked at very carefully from an
18 erosion and slope stability standpoint. That particular
19 detail, beyond what I see in the photographs to me
20 would be in the next panel on geotechnical because that
21 becomes a detail, in other words I look at it, I can
22 see the history of sloughing in the area, it doesn't
23 look particularly aggressive to me. I can't honestly
24 move the route because of obvious instability, but
25 I do think it is of a character that certainly has to
26 have a careful look, and I think that the geotechnical
27 people will be looking at that, and obviously that
28 will be probably the place on that route where they
29 would direct their most attention, their greatest
30 detailed attention.

Dau, Williams, Mollard, Watson
Cross-Exam by Gibbs

1 Q And Dr. Mollard, are
2 you the author of this 14-D, "Environmental Statement"
3 portion of Exhibit 66?

4 A No, I'm not.
5 MR. GIBBS:
6 Might I ask my friend
7 whether the author of this will be on a panel here
8 at some time?

9 MR. GENEST: We are calling
10 Mr. Horthy and environmentalists. I think by the time
11 we're through our evidence you will have heard
12 everybody.

13 MR. GIBBS: I think so, too,
14 but I'm wondering whether Dr. Mollard is the wrong
15 person to speak to this portion?

16 A Well, I think I looked
17 at it from an engineering and geological, which we've
18 been discussing, and you're mentioning environmental
19 which would get into another group, discussing the
20 environmental vegetation, so on, and I think maybe --
21 I haven't read what you're referring to but --

22 MR. GENEST: From the
23 point of view of rodent control and the concerns
24 raised by those, the next panel are going to be
25 dealing fully with those.

26 MR. GIBBS: Well, let me try
27 one more and see whether this is within your competence,
28 Dr. Mollard.

29 Q On page 17 of the same
30 volume, I read that:

"The bed rock of these hills consists of

Dau, Williams, Mollard, Watson
Cross-Exam by Gibbs

1 shale, which is partially unstable as indicated
2 by a number of small landslides along the edge
3 of the hills, and tend to be more prevalent
4 following forest fires."

5 Isn't that a geological comment within your knowledge?

6 A If my memory is right,
7 those are cretaceous, I think possibly, well cretaceous
8 shales and sandstone. Now, in answer to that, in detail
9 -- I haven't been over it on the ground -- my reaction
10 is why, if there's soft easily erodable shales, are
11 they standing up so high? And I would suspect that
12 maybe the cap -- that's the top layer that's holding
13 them up -- is a more resistant bed. Maybe sandstone,
14 and it's true that there is -- we can see instability
15 locally around those hills, but where the route goes
16 over the nose of the hill, at that location on the
17 right-of-way, following the flattest slope, I see in
18 the photographs no sure sign of recent instability or
19 in fact, older major instability. There might be slight
20 long-term creep, slope-wash and things of that
21 nature, I suspect there is, but -- and I can see and
22 have identified failures away from the, substantially
23 away from the right-of-way, but the impression I got
24 on that slope is right where the line comes down, it's
25 a fairly smooth slope, you can take a fairly smooth
26 slope, and it certainly doesn't look like the one that
27 you're looking at there in the photographs, or in the
28 map which looks so steep. So true, it will have to be
29 looked at carefully, and as I say, I've looked at an
30 alternate route somewhat to the north which is flatter

1 but longer, and if field work shows that it's too
2 tough I would assume that the bnger route might have
3 to be considered, but I don't think you can rule it
4 out at this stage with the information we have. That
5 is looking at it from my standpoint, looking at
6 aerial photographs.

1 Q And then I take it that
2 when you go in and do your bore holes you may determine
3 that you have to go around it.

4 A Well, I would say,
5 having seen the whole thing, that there are alternate
6 routes to the north and south of the hills and they
7 both have pluses and minuses, the longer versus
8 the different kinds of terrain and it might be
9 in answer to your question that if drilling proved
10 that it was unsuitable, then certainly I think one
11 of these alternates might have to be considered.

12 Q Well, it seemed to me
13 that the Ebbutt Hills were all minuses. You have got
14 a possibility of landslides on the slopes, which
15 the author here says, and I take it that you agree
16 that there is the possibility --?

17 A Yes, there have
18 been slides away from the line, yes.

19 Q And you took some comfort
20 from what you assumed the surface, the plateau
21 to be?

22 A Well, I think, I would
23 certainly examine the higher exposed cliffs off the
24 line to see if they were not a stronger rock at the
25 top.

26 Q You see that this author
27 in exhibit 66 says of the top, "The relatively flat
28 tops of the Ebbutt and Redknife Hills are often
29 occupied by frozen peat deposits. Seismic lines
30 have
through the area/in the past caused some thermal

1 erosinn, and does not that give you concern, sir?

2 A Well, I think that is
3 for the next panel in the design of how they handle
4 those concerns and of course the environmentalists
5 which will speak to that question. My answer is
6 simply, having looked at many, many hills like the
7 Ebbutt Hills, many -- and mapping them and having
8 roads go over them, over the past, I could not say
9 that you have to move that line for instability without
10 doing further work.

11 Q Would it be within
12 the type of services that you have been performing
13 in the past for the applicant that you would go and
14 do the further work and come up with a recommenda-
15 tion --

16 A No, I would not -- the
17 applicant has a large staff of very capable people
18 that do that.

19 Q Yes --

20 Mr. Commissioner, I am about
21 to change to another subject. Did you want to continue
22 longer, or is this a convenient time --

23 MR. SCOTT: It is a little
24 earlier than usual, but if it is convenient to you,
25 Mr. Commissioner, we have no objection.

26 THE COMMISSIONER: Well,
27 I think that we will accomodate you, Mr. Gibbs. Just
28 before we do adjourn. Just -- Mr. Dau, looking at
29 this map distributed yesterday which shows the
30 relocation of the pipeline to avoid the crossing of

1 the Liard River, that is what we are talking about
2 and have been for the last 15 or 20 minutes, the
3 location or at least the route was changed for
4 285 miles, something like that and that was so
5 that you would not have to cross the Mackenzie and
6 then the Liard, it was to enable you to avoid one
7 river crossing, am I right?

8 MR. DAU

9 A Yes.

10 Q And you said yesterday
11 that your concern was that the possibility, you
12 put it no higher certainly, of a failure of the
13 pipeline under the river would necessitate a shut
14 down of the pipeline for one or two months and
15 to avoid any such contingency it was decided to
16 alter the route of the pipeline for 285 miles.

17 Now, can you tell me when
18 it was decided to alter the route of the pipeline
19 to avoid the crossing of the Liard? I know that
20 you filed this last fall sometime, but when was
21 that decision made?

22 A Could I back
23 up for just one moment sir?

24 Q Yes.

25 A The decision was made
26 to install dual pipelines across the major critical
27 rivers. In the Liard River it has bedrock right
28 at the bottom of the river and that would probably
29 not be one of the ones that would be dualled.
30 Going through the exercise in costs and all of the

1 considerations by having the dual crossing on the
2 originally filed route at Burnt Island and a crossing
3 of the Liard, that is much more expensive than a
4 dual crossing above Fort Simpson at which point the
5 river is smaller because it is below the confluence
6 of the Liard.

7 Now, as to when -- I cannot
8 give you a precise date, it has been under active
9 consideration for about a year. We, of course, have
10 done many cost studies and we have done some in-
11 vestigation, field drilling and so on, but it is
12 approximately a year.

13 Q But just so that I
14 understand this, Mr. Day, by altering the route of
15 the pipeline over this 285 mile section, you managed
16 to avoid crossing the Liard and what had been two
17 river crossings became one --

18 A That is correct.

19 Q The new route takes
20 you over the Ebbutt Hills and it was because of
21 that desire to avoid the Liard and simply to have
22 one crossing of the Mackenzie that you got into the
23 middle of the Ebbutt Hills.

24 A That is correct.

25 Q And there have been, I
26 take it, no -- you have not done any drilling in
27 the Ebbutt Hills?

28 A No, not as yet, no.
29 I have flown over the Ebbutt Hills. I have completed
30 a reconnaissance of this particular route in a

1 helicopter and I noticed no unusual construction
2 difficulties as far as the Ebbutt Hills are concerned.
3 WE have to rely on Dr. Mollard of course for his in-
4 terpretation of what is below ground.

5 THE COMMISSIONER: Well,
6 thank you, we will adjourn for ten minutes.
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8 (PROCEEDINGS ADJOURNED FOR TEN MINUTES)
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Dau, Williams, Mollard, Watson
Cross-Exam by Gibbs

(PROCEEDINGS RESUMED PURSUANT TO ADJOURNMENT)

MR. GIBBS: Q Mr. Dau, will you now examine exhibit -- or have in front of you Exhibit 59 entitled:

"Alternative corridors and systems of transportation."

A I have it.

Q And sir, you conducted a study of all of those alternatives in Exhibit 59?

A Yes.

Q Including the ones entitled:

"Alternative systems"?

The ones after the tab, "Alternative systems".

A Yes, they were not conducted by me personally. We retained people to do that.

Q And are those -- does that book, Exhibit 59, contain all of the alternates that you studied?

MR. GENEST: Mr. Commissioner, I hate to keep on interrupting Mr. Gibbs but I thought there was some sort of staging in these hearings. We seem to be heading into an examination of alternative systems of transportation which you, sir, have reserved for a later part of the hearings, and I ask where this is heading?

MR. GIBBS: Well, sir, I have a letter my friend wrote to me on the 19th of February that I received on the 4th of March, and he said:

Dau, Williams, Mollard, Watson
Cross-Exam by Gibbs

1 "Following our discussions,"
2 I'm sorry, he wrote it to Commission counsel and sent
3 me a copy,

4 "...I'm now in a position to advise that the
5 evidence of Arctic Gas in Phase 1 will be
6 presented in the following order through the
7 following witnesses:

8 1. Facilities location. Application Section
9 8-A.

10 Connecting pipeline facilities, Section 9
11 and Alternative corridors, Section 14-E-1."

12 MR. GENEST: Well, that was --

13 MR. GIBBS: I thought I was
14 proceeding properly on alternative corridors.

15 MR. SCOTT: Mr. Commissioner,
16 to that letter
17 there is a subsequent letter/in which by agreement
18 of the counsel who participated in the last meeting
19 of counsel, it was determined that the corridor question
20 should be deferred to a separate phase at which it will be
21 dealt with later, in short, I'm sorry Mr. Gibbs didn't
22 get that letter. Everybody else except Mr. Templeton
23 did. Maybe Mr. Gibbs and Mr. Templeton have the same
24 problem in the same postal region. But I would invite
25 him to defer his questions on alternative corridors
26 to the later phase, if he could.

27 MR. GIBBS: Well, it may make
28 the rest of this more choppy than the beginning, than
29 the earlier part has been, but I'll try and observe
30 that, sir.

Q Mr. Dau, did you do any

Dau, Williams, Mollard, Watson
Cross-Exam by Gibbs

1 studies of the economic feasibility of a pipeline from
2 the Mackenzie Delta to the 60th Parallel only?

3 A No sir.

4 Q You're aware that such
5 studies have been done?

6 A Yes. Our studies are
7 by line sections, if that's what you're referring to.
8 We have some cost information by line sections which
9 can be cut off at the 60th Parallel, but we did not
10 do a particular study that only went to the 60th
11 Parallel.

12 Q Well, sir, on the top
13 of your page 7, coming back to your prepared evidence,
14 you are speaking about the most economic pipeline, the
15 shortest distance between the source of supply and
16 the point of delivery.

17 A Right.

18 Q And I'm sure that's what
19 guided you in your work for your client, and I wonder
20 whether in keeping with that principle you did any
21 examination of the economic feasibility of taking the
22 delta gas to the 60th Parallel and feeding it into
23 existing transmission systems?

24 A We did not, sir.

25 Q But you know that there
26 was such a study done? Not by your group --

27 A I'm not aware of the
28 specific study, sir, no.

29 Q Were you never given to
30 examine, Mr. Dau, a document entitled:

Dau, Williams, Mollard, Watson
Cross-Exam by Gibbs

1 "Evaluation of transporting Arctic natural
2 gas through expanded Canadian systems,"
3 prepared for Gas Arctic Northwest project study
4 group by the Alberta Trunkline Company Limited and
5 Trans-Canada Pipeline.

6 A I've probably seen it,
7 sir. I've completely forgotten the details of it.
8 Would I have the date of it?

9 Q It seems to have gone
10 forward to the chairman of the Board of Canadian
11 Gas Arctic Northwest Project Study Group on November
12 7, 1972.

13 A I'm sure I've seen it.
14 I've forgotten about it.

15 Q Were the means of
16 transportation, the routing and so on, were any of
17 those things within your discretion? For example,
18 the study that I've just referred you to, was it
19 within your discretion whether you studied that as
20 an alternative, or did you only study those alterna-
21 tives which you were instructed to study by the
22 management of Canadian Arctic Gas Pipeline?

23 A It would be on their
24 instructions with respect to delivery points.

25 Q And it would be because
26 you were not instructed to do so that you didn't
27 consider or study the feasibility of going only from
28 the delta to the 60th Parallel and into existing
29 systems?

30 A That would be correct.

Dau, Williams, Mollard, Watson
Cross-Exam by Gibbs

1 Q And then, sir, it may
2 well be that such a project could meet your most
3 economic tests of the shortest distance between the
4 sources of supply and the points of delivery?

5 A If that was a delivery
6 point, yes sir.

7 THE COMMISSIONER: The
8 delivery points at the 60th Parallel, is that what
9 you were asking?

10 A If the delivery point
11 was at the 60th Parallel, wherever that point was,
12 obviously would require study just in that phase
13 from that delivery point back to the source of supply.

14 MR. GIBBS: Q Or if the
15 delivery point was at Toronto.

16 MR. GENEST: I cannot follow
17 that question, sir.

18 MR. GIBBS: Well, sir,
19 it still might be the most economic pipeline route
20 to carry the Canadian gas from the Mackenzie Delta
21 to the 60th Parallel, and through existing systems
22 to Toronto, as far as you know.

23 A If the delivery point
24 was Toronto, it would depend on the volumes that were
25 transported, it would depend on the load build-up,
26 and so on. I can't respond to the question without
27 knowing some of those details.

28 Q You have no advice to
29 give in that respect?

30 A No sir.

Dau, Williams, Mollard, Watson
Cross-Exam by Gibbs

1 Q Now, sir, with respect
2 to the dual pipeline crossing of some of the rivers
3 which you spoke about already to the Commissioner,
4 those you propose for reasons of security --

5 A Yes.

6 Q -- security of supply.

7 A Yes.

8 Q Are there any other
9 places on the prime route where security of supply
10 might be as equally to be considered as in the river
11 crossing?

12 A I'm not aware of any,
13 sir.

14 Q Could you procure
15 Exhibit 54 and have it in front of you, please?
16 "Location, design and capacity of facilities, Section
17 8, and connecting pipeline facilities, Section 9."
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1 MR. GENEST: What was the
2 reference, I am sorry?

3 MR. GIBBS: I just had not got
4 the page reference yet, I was going to come to that
5 in a moment.

6 Q And sir, when I read
7 page 14 of section 8B 1 -- 8B 1-3 -- on page 14 there
8 is a dissertation on earthquakes in the, I take it,
9 Yukon and Alaska --

10 A Yes.

11 Q And I ask you whether or
12 not that earthquake possibility or probability is not
13 as equally dangerous in terms of security supply
14 as your river crossings.

15 A I am not the witness to
16 respond to that, sir, I am not an expert in this
17 particular area. It is my understanding that that
18 is not so, but someone else would have to respond
19 to your question.

20 Q Is Dr. Mollard able
21 to speak to that?

22 DR. MOLLARD:

23 A No, I think that is
24 dealt with elsewhere in subsequent --

25 Q Would my friend care to
26 enlighten me on whether --

27 MR. GENEST: That subject
28 will be dealt with by the geotechnical panel.

29 MR. GIBBS: All right.

30 Q Mr. Dau, was any

Dau, Williams, 1802
Mollard, Watson
Cross-Exam by Gibbs

1 consideration given to having a twin pipeline through
2 those earthquake prone areas?

3 A No, sir.

4 Q Without going into
5 the detail of the language in that reference, you
6 would agree, I presume that an earthquake possibility
7 is as much a danger as a river break?

8 A I am not sure that the
9 possibilities are equal, sir. I do not know --

10 Q The results would be
11 the same.

12 A Not necessarily, no,
13 sir.

14 Q Well, what is the
15 difference if the pipeline busts because of an earth-
16 quake or because of something that happened in the
17 river? In both cases you lose your supply, do you
18 not?

19 A The problem with
20 repair with the river crossing relates to the time
21 it takes to get back into service. Under the worst
22 conditions that I spoke of yesterday of a freeze
23 up in the river or break up in the river, it would
24 not be possible to quickly repair the line. A
25 failure resulting from an earthquake could be
26 repaired much more quickly.

27 Q Depending on the
28 time of year and the scale of the earthquake and so
29 on --

30 A Yes, the time of

1 repair, the length of the time of repair certainly
2 is -- would be affected by the time of year.

3 Q Yes.

4 Mr. Dau, yesterday when
5 you were describing the route with reference particu-
6 larly to the pullout map in exhibit 54, attention was
7 drawn to -- on the Yukon/ Alaska portion -- to
8 future compressor station sites.

9 A Yes --

10 Q Do you propose that those
11 future compression station sites be built while you
12 are building whatever, whether it is the interior or
13 the coastal route?

14 A Yes, the facilities
15 that would be constructed would consist of the
16 gravel pad at the location. They would contain
17 scraper traps, they would contain communication facili-
18 ties and they would be a location where maintenance
19 equipment would be stored. There are some buildings
20 located at these sites and some of them obviously
21 include landing strips for access.

22 Q And the same thing
23 applies to a lesser extent on the leg from Travaillant
24 Lake up to Richards Island?

25 A It is the same, sir.

26 Q And you are going to
27 build those compressor stations at the -- during the
28 construction phase to avoid having to go back in to
29 build them later on?

30 A No -- not the future

1 ones, sir, they are required for the operation of
2 the pipeline. They are facilities at those locations
3 that are required for operation -- we are required
4 to get into the scrapper traps for instance, communica-
5 tion facilities and the operation and maintenance
6 equipment.

7 Q But the intention is
8 in the future to make use of them for compressor
9 sites?

10 A Oh, yes, Mmm-hmm.

11 Q And that time will come
12 when you want to boost up the throughput of those
13 portions of the line to four and a half billion
14 cubic feet a day? Is that correct?

15 A I am sorry, I do not
16 quite understand that --

17 Q Well, as I understand
18 your scheme, you start off moving two and a quarter
19 billion feet a day through from Alaska.

20 A I believe that it is
21 two and goes to two and a quarter, yes.

22 Q And you will have the
23 necessary compression and so on to enable that to
24 be done.

25 A Yes.

26 Q And then you will
27 only add compression later on to increase that daily
28 throughput?

29 A That is correct.

30 Q And those future

1 compression sites are intended to furnish a place
2 for compression which could build that throughput
3 up to four and a half billion cubic feet a day?

4 A That is correct.

5 Q That is correct.

6 And the same is true of the
7 line from Richards Island down to Travaillant Lake?

8 A That is correct.

9 Q And so then it is, I
10 take it, your intention that in due course those two
11 sections will operate at four and a half billion
12 cubic feet a day?

13 A They are capable of it,
14 sir, yes.

15 Q And you are putting
16 the compression sites there because you intend that
17 that shall be the result?

18 A That is correct.

19 Q And that gives you the
20 most economic unit cost of transportation?

21 A That was our instructions
22 to design those facilities at an optimum throughput
23 and those stations are located on that criteria.

24 Q And when that time
25 comes sir, is the time when you will have to double
26 the 48" line down from Travaillant Lake to Caroline?

27 A That would be correct
28 under those conditions.

29 Q Have you forecast when
30 that time will come?

1 A I have not.

2 Q Have you been asked to
3 do so for purposes of forecasting capital require-
4 ments and so on?

5 A No, we have not.

6 Q Have you been asked to
7 do anything with respect to engineering services for
8 the adding of the compression stations -- those that
9 are marked as future stations?

10 A Expansion beyond the
11 four and a half --

12 Q No, no -- the addition
13 of the compressor stations that are marked as
14 future stations? Have you been asked to perform
15 any services for those?

16 A No, sir.

17 Q Have you been asked to
18 study the feasibility of a second 48" line from Tra-
19 vaillant Lake to Caroline, Alberta?

20 A No, sir.

21 Q In any event, sir,
22 whatever future time that might be, is it not a
23 fact that once your system is in the ground and
24 operating, the one that you have designed and so on,
25 you are compelled to add to that system at an average
26 rate or cost of \$280 million each year after it goes
27 into operation to overcome the problem of the
28 declining rate base?

29 THE COMMISSIONER: The
30 declining what?

MR. GIBBS: Rate base.

Q You do not know anything about that?

A I know nothing about that, sir, I am sorry.

Q You are not familiar with rate making --?

A No, sir,

Q -- and return on rate base and so on?

A No, sir, --

Q Mr. Dau, are you able to give your opinion of when the Alaska gas will be available to come through into the Yukon sections of your project?

A Only what it is filed sir. The instructions we received that the gas would be available in accordance with the throughput build up in the documents.

Q You have not conducted any separate investigation to see whether that gas will be physically available in accordance with the build up schedule you used.

A We have not.

Q Now, sir, you have also in Exhibit 60 -- described on some of the maps alternate corridors called the Fort Yukon and Fairbanks corridor.

A Yes.

Q I beg your pardon?

1 A Yes.

2 Q yes.

3 And would the use of those
4 corridors avoid the environmental problems which
5 seem to bear on the coastal and the interior route?

6 MR. GENEST: Well, here
7 we go again, Mr. Commissioner. I am sorry to be
8 objecting so often, but it seems to me that if this
9 line of questioning goes on then there seems to
10 be some sort of burden on me to -- in re-examination
11 or rebuttal during this phase to start talking about
12 these corridors and I thought we had a clear agree-
13 ment, at least between counsel, which in my impres-
14 sion at least had received your approbations
15 that we would defer all discussions on these alternative
16 corridors until later on.

17 MR. GIBBS: I am sorry, I
18 transgressed. I had overlooked what Commission
19 Counsel had said.

20 Well, without discussing
21 the corridors in detail I do want to draw from this
22 witness a -- some evidence on that route by asking
23 him if the use of either those corridors would not
24 mean, in effect, duplicating your prime route down the
25 Mackenzie Valley because they both end up at Caroline,
26 Alberta.

Day, Williams, Mollard, Watson
Cross-Exam by Gibbs

1
2 A Duplicating the prime
3 route, sir, it's a different system.

4 Q You have two pipe-
5 lines ending up in Caroline, and both beginning in the
6 north.

7 A These are alternatives,
8 sir.

9 Q I see, alternatives
10 to the prime route?

11 A Yes, they were examined
12 in that context, yes sir. They are alternative
13 corridors.

14 Q I see.

15 A They were rejected.

16 Q Rejected for what
17 reason?

18 MR. GENEST: Well, Mr.
19 Commissioner, again I must object.

20 MR. GIBBS: Perhaps, Mr.
21 Commissioner, because I haven't received the letter, I
22 could be informed as to who and when --

23 MR. GENEST: Mr. Hollingworth
24 was present at a meeting of counsel when this matter
25 was discussed.

26 MR. GIBBS: Well, sir, I'm
27 sure there's no great problem in someone telling
28 me at this point in time

29 MR. SCOTT: We're trying to
30 find a copy of the letter.

Dau, Williams, Mollard, Watson
Cross-Exam by Gibbs

1 MR. GIBBS: I'm sorry, I don't
2 want to arouse my friend here.

3 THE COMMISSIONER: I hate to
4 say it, but I'm not absolutely sure I've seen this.

5 MR. SCOTT: A copy wasn't sent
6 to you. At the meeting of counsel at which Mr.
7 Hollingworth was present, in which the original letter
8 that Mr. Genest referred to, in which the matters
9 contained in the original letter of February 19th were
10 discussed, there was strenuous objection from some
11 about the inclusion in Panel 1 of matters that deal
12 with the corridor. The result of that meeting --
13 let me put it this way -- at that meeting Arctic Gas
14 and their counsel took the position that the corridors
15 should fall to be considered in Panel 1. I think they
16 felt a little outnumbered as a result of the discussion
17 and they undertook therefore to consider their position,
18 and Mr. Genest wrote me on February 26th and he said:

19 "I have considered our discussion with reference
20 to alternative corridors and routes and have
21 been persuaded by you that notwithstanding my
22 letter on the subject,"

23 and in parenthesis, his letter on the subject is the
24 one to which Mr. Gibbs is referring,

25 "the matter should, as suggested by Mr.
26 Anthony, be dealt with separately at a later
27 stage in the hearings."

28 Then he says:

29 "I have therefore --

30 he refers to some other matters not connected, and

Dau, Williams, Mollard, Watson
Cross-Exam by Gibbs

1 he says:

2 "I have therefore deleted from Mr. Dau's
3 testimony any reference to alternative
4 corridors and agree that Arctic Gas will
5 deal with these matters at a later stage
6 in the hearings."

7 Now if that letter was not adequately communicated,
8 I apologize to my friend. I think it was clear from
9 the meeting of counsel that that was the result that
10 would obtain if we could bring Mr. Genest around. We
11 did.

12 MR. GIBBS: I wonder, sir, if
13 there could be some indication at what stage? Is it
14 going to be in this Phase 1 or some later phase?
15 There is some need to do some preparatory work and to
16 arrange one's calendar and so on.

17 MR. SCOTT: Well, I think we
18 have got this far, Mr. Commissioner. We have -- at
19 the meeting of counsel, now that Mr. Genest has come
20 around, agreed that this would be an appropriate
21 phase to be dealt with following Phase 4. It was not
22 clear precisely how it would rank with the other
23 matters that will follow Phase 4, but that, it seems
24 to me, will allow Mr. Gibbs a little time to prepare
25 his questions that relate to the corridors.

26 MR. GIBBS: It seems to allow
27 quite a lot of time. It doesn't seem to fall really
28 in subject matter. I would have thought Phase 1 was
29 the place, but if that's what is going to happen, why
30 --

Dau, Williams, Mollard, Watson
Cross-Exam by Gibbs

THE COMMISSIONER: Well, Mr.

Gibbs, let me make this clear. Mr. Scott has been holding meetings of counsel to sort out matters by agreement where possible, so that we don't spend all our time listening to lawyers argue during the course of these hearings. Where counsel have reached agreement, Mr. Scott has informed me and the matter has simply been left there. But neither Mr. Genest nor you nor any other counsel should feel that if at a meeting of counsel you're out-voted that you cannot raise the matter at the Inquiry in open session and put your point of view before me. I have simply advised Mr. Scott, and I understood he had advised all of you, that if you reached an agreement about the way to proceed, that that would be all right with me.

If you can all agree, it seems to me that that will expedite the hearings, but if you're not satisfied with this arrangement, don't hesitate to complain about it to the Inquiry. Before you do, I think it's a matter that, Mr. Scott, counsel should meet and discuss again. It may be that in light of what we've heard yesterday and today that the arrangement proposed by Mr. Scott is one that isn't appropriate. It may be that it's some other arrangement would suit all concerned a little better; but I don't want anybody to think that Mr. Scott by himself, or abetted by a majority of counsel, can suppress anyone's right to speak to the Inquiry.

MR. GENEST: I was the object of Mr. Scott's brief persuasive abilities.

Dau, Williams, Mollard, Watson
Cross-Exam by Gibbs

1 I was persuaded that that was the case. But this has
2 ramifications, it seems to me that matter was dis-
3 cussed subsequently to those letters, at a meeting
4 which Mr. Hollingworth, who is co-counsel here with
5 Mr. Gibbs, was present. No objection was
6 registered, and it affects very much the preparation
7 of my witnesses. I am simply not ready to present
8 coherent evidence to this Inquiry on that subject at
9 this time, and I think it's a little unfair to raise
10 it, to sort of put me in that position at this time.

11 THE COMMISSIONER: Let Mr.
12 Scott have a word in.

13 MR. SCOTT: Mr. Commissioner,
14 having been put in my place about my role, let me
15 make it clear that the first meeting that took place
16 in Toronto, the only objection to this scheme came,
17 as I understood it, from Mr. Genest. Mr. Anthony had
18 certain concerns about the timing of the phase, but
19 accepted the proposition that the matter should be
20 dealt with in a separate phase. So that at that
21 meeting of counsel in Toronto all who attended -- and
22 I think that included Mr. Gibbs or his representative
23 although I'm not certain -- there was unanimity except
24 for Mr. Genest, who wanted to deal with it in Phase 1.
25 We persuaded him, and when I say "we" I mean I,
26 persuaded him that he should give way on that and he
27 did, by the letter I've indicated. The matter was dis-
28 cussed as recently as last week -- it seems about a
29 year ago now but in fact it was last week, I think
30 on Tuesday night, at a meeting in which counsel for

Dau, Williams, Mollard, Watson
Cross-Exam by Gibbs

1 Foothills was present, and there was no objection to
2 that proceeding.

3 I can recognize Mr. Genest's
4 difficulty at this stage in being invited to deal
5 with it, and indeed the difficulty that other counsel
6 will face if it is regarded that these questions are
7 properly to be dealt with by this panel.

8 MR. GIBBS: Well, sir, I
9 didn't intend to provoke all of that, I thought I
10 was trying to abide by the fact that this panel was
11 not going to deal with these things and I was merely
12 trying to find out when someone was going to, and
13 in keeping with what you have said, if I feel that
14 some after Phase 4 is not the proper place, then I
15 will again address ^{you on} the question at some later time.

16 That completes my cross-
17 examination, sir.

18 THE COMMISSIONER: Thank you,
19 Mr. Gibbs.

20 MR. ANTHONY: Mr. Commissioner,
21 I believe I am up next. I wonder if it is up to me
22 to move forward?

23 THE COMMISSIONER: Yes, I
24 think you should come forward to where Mr. Gibbs
25 has been standing.

26 MR. ANTHONY: Ballowed
27 ground. Mr. Commissioner, perhaps before I commence
28 questioning, I could give my understanding of the way
29 I propose to proceed to ensure we don't come into the
30 same sort of argument about relevancy and staging the

Dau, Williams, Mollard, Watson
Cross-Exam by Anthony

1 evidence. My understanding of the arrangement, and I
2 have discussed this with Mr. Marshall of Arctic Gas
3 as well as Commission counsel, that I propose to refer
4 to Section 14-E for the purpose of identifying alternate
5 routes, and then I will be discussing criteria as the
6 panel has led but I do not propose to go into an
7 evaluation of the various alternatives. I believe that
8 that is the -- my understanding is that was the sort
9 of thing that would take part at a subsequent time
10 and I propose at this time merely to identify them for
11 purposes of route selection, in the context of route
12 selection, and deal with an evaluation of them, and
13 whether one is preferable over another, and under
14 what basis, at a later stage.

15
16 CROSS-EXAMINATION BY MR. ANTHONY:

17 Q Mr. Dau, perhaps before
18 starting with the questioning, I could get the cast
19 of characters straight in my own mind. The panel that
20 you have before us are basically engineers who have
21 provided the services through the engineering side of
22 it, and you have advised in your testimony yesterday
23 that you also had a number of -- under the label of --
24 environmentalists who also reported to you. I'm won-
25 dering if you could just briefly describe the discip-
26 lines that in fact were reported to you under the
27 general heading of the type of environmental work that
28 was done?
29
30

1 A I will try it. Northern
2 Engineering Services has on staff, biologists in the
3 vegetation area. They are employees of Northern
4 Engineering Services. Northern retained consultants
5 in other areas to assist us and they were in the
6 three main classifications of mammals, fish and birds.

7 Q Now, in your synopsis
8 of evidence as part of Appendix B you listed a number
9 of what I might call environmental reports and I
10 assume that these are the sum of the reports that
11 the consultants provided to Northern Engineering
12 Services?

13 A Yes.

14 Q And I would suspect
15 also that the biological report series which is part
16 of the supporting information of the Arctic Gas Appli-
17 cation is also information that came to you through
18 this consultative process?

19 A yes.

20 Q And further the environ-
21 mental social program sponsored by the Government
22 of Canada on northern pipeline development, that
23 environmental information was also then communicated
24 through to Northern Engineering Services?

25 A I am not familiar
26 with what you are referring to, sir.

27 Q Well, the -- under the
28 environmental social program -- or the Environmental
29 Social Committee on Northern Pipelines, a task force
30 on northern oil development reported a series of

1 reports on Northern pipeline development and I
2 was wondering if these reports were also communicated
3 through your consultants to your Northern Engineering
4 Services as part of the information upon which they
5 based their decisions.

6 A I believe they were,
7 sir. I am familiar with that document -- I see.

8 Q And in the list of
9 documents provided by Arctic Gas to this Commission
10 Inquiry pursuant to the preliminary rulings, there
11 are a number of also environmental reports that were
12 prepared by various consultants on behalf
13 of Arctic Gas. Without getting into any detail
14 can we also assume that this information was available
15 to Arctic Gas as a part of its decision making process?

16 A Yes.

17 Q In any event, you, Mr.
18 Dau, through Northern Engineering Services, had
19 carriage of the matter of route selection and had
20 in fact, final say when these compromises and so on
21 had to be made?

22 A I would not say that
23 I had final say on a compromise. It was at the
24 April meeting I referred to yesterday. All of these
25 were discussed and there were recommendations as to
26 changes in route from -- to alleviate some concerns
27 in those particular instances, I would have to
28 say that the referee was Canadian Arctic Gas itself.
29 We would provide the engineering input -- there may
30 have been some other environmental input with respect

1 to a route location if there could not have been a
2 degree -- or an agreement at that stage, certainly I
3 did not have the final say and said, "It is going
4 there." That was not my role.

5 Q Well, just to perhaps
6 enlighten me on the inner workings on the decision making
7 process at this stage. Assuming that you had a
8 report from your -- as you outlined in your evidence
9 of the conflict and possible routing between your bird
10 man and your mammal man, now, I would assume that they
11 would report to you in meetings such as the April
12 meeting you described.

13 Now, the compromise
14 that you referred to would be by mutual agreement, I
15 expect, but if an agreement could not be made, who
16 would make the selection?

17 A We would come up with
18 what would be an acceptable engineering solution and
19 would take it to Canadian Arctic Gas with the recommen-
20 dation that this be done. The decision obviously has
21 to be Canadian Arctic Gas in that instance.

22 Q I see, and as a result
23 for example of the April meeting, did you have a
24 series of recommendations on route location that
25 you made to ARctic Gas?

26 A I think all the revisions
27 that were made were by agreement. We cannot recall of
28 an instance where it -- there was a final decision by
29 Canadian Arctic Gas to do it in a certain way. I
30 think the -- in my recollection -- in any of the

Dau, Williams
Mollard, Watson
Cross-Exam by Anthony

1820

1 changes that were made were accepted, this has been
2 really what I am saying.

3 Q And who did you report
4 to at Arctic Gas then?

5 A At that particular time
6 to a Mr. Harvey.

7 Q And do I understand what
8 you have said now, that you cannot recall of any
9 instance where a recommendation as far as route
10 selection is concerned, was changed or altered by
11 Arctic Gas?

12 A One moment sir --
13 As we can recall it sir,
14 they were by agreement. We cannot recall of one
15 where there was a decision by Arctic Gas
16 Personnel that said "well, okay, do it this way."
17 I cannot recall any of those, sir.

18 Q So in fact then the
19 decisions were made within Northern Engineering
20 Services?

21 A In that sense, yes,
22 sir.

23 Q Thank you. And I have
24 to just cover a point briefly, I would expect then
25 that the environmental consultants that you have
26 been referring to will be presented by my friend at
27 some later stage.

28 MR. GENEST: Yes.

29 MR. ANTHONY:

30 Q Mr. Dau, have you or any

Dau, Williams
Mollard, Watson
Cross-Exam by Anthony

1821

1 members of your panel been involved in route selection
2 for any other mode of transport, for example an oil
3 pipeline, highway, railroad, and so on?

4 A Yes, we -- as individuals
5 we have in the past, yes. Not as -- Northern
6 Engineering has not performed that function, is that
7 your question?

8 Q yes, I --

9 A Northern Engineering has
10 not done route location for oil pipelines or railroads
11 and so on.

12 Q But the experts available
13 to this Inquiry, basically yourselves and others have
14 in fact been involved in route selection for example
15 an oil pipeline at some stage in their career?

16 A Oh, yes, certainly,

17 Q And would I be right
18 in saying that the techniques involved are generally
19 the same for example an oil pipeline as for a gas
20 pipeline?

21 A No.

22 Q I wonder if you could give
23 me an indication of the relative flexibility of routing
24 of an oil pipeline, for example, as compared to a
25 gas pipeline.

26 A The flexibility of rou-
27 ting?

28 Q Well, perhaps I should de-
29 fine my term a little more specifically. If, in cer-
30 tain terrain circumstances, for example, if a gas

1 pipeline could make short turns within a shorter area
2 or could accomodate a steeper grade and so on , I
3 expect would be a more flexible system -- in other
4 words, you could move it more directions and at
5 more places than you could for example if a line
6 could not take a steeper grade or could not be moved
7 in that easy a fashion. Using that as a definition
8 of flexibility, would you view for example, a
9 gas pipeline as a more flexible system than an
10 oil pipeline, for example?

11 A It is difficult to
12 answer the question unless you get more specifics--
13 for instance: a hot oil pipeline is entirely different
14 than a cold gas pipeline. In very rugged terrain,
15 mountainous terrain, grades are more important to an
16 oil pipeline than to a gas pipeline. The degree of
17 bends that you can make in a piece of pipe is not depen-
18 dent on whether it is carrying oil or gas.

19 Q All right, so dealing
20 for example with rugged terrain, a gas pipeline would
21 be more flexible in the definition that we have
22 given --

23 A Under your definition. Yes.

24 Q Now, given again,
25 in that question of terrain, what about as comparison
26 to a railroad?

27 A Pipelines are much more
28 flexible than railroads.

29 Q And what about as
30 compared to a highway?

1 A Much more flexible
2 than highways again because of grades.

3 Q Now if you were -- as
4 a result of your experience, I would like
5 to call on your experience here, would you perhaps
6 rank for us in degrees of flexibility in rugged terrain
7 a railroad, a oil pipeline, a highway, and a gas
8 pipeline. Perhaps, so I do not confuse it -- I
9 gather from what you have said that the gas pipeline
10 is more flexible than a railroad, for example.

11 A Yes.

12 Q Now, would you on the
13 basis of your experience rank just those four systems
14 just to give us a general idea. Railroad, a hot
15 oil pipeline, a highway, and a gas pipeline.

16 A Yes, it would be a
17 gas pipeline, then an oil pipeline, then a highway
18 then a railroad.

19 Q The first you mentioned
20 being the most flexible?

21 A Yes.

22 Q Thank you --

23 A And there is not that
24 much difference between the oil and the gas pipeline,
25 there is a difference.

26 Q Thank you. I would
27 like to bring before the INquiry a -- to deal with
28 the alternate routes that are in fact, have been con-
29 sidered or could be considered and as I say, while
30 the evaluation of these various routes and the

1 appropriateness of the various routes will be deferred,
2 I would like to at least identify what it is we
3 are talking about and I would bring your attention
4 to exhibit number 60 which is "Alternate Corridor
5 Drawings" Sub-section 14 (e) .1.10 and in particular
6 the first map in that report entitled "Alternative
7 Corridors and Geologic Provinces and Basins."

8 Do you have that before you?

9 A At the
10 very front?

11 MR. ANTHONY: At the
12 very front, yes. It is map number 4-0204-1014.

13 Now, you have in the context
14 of your evidence in chief described what you called
15 the prime route. You have also described the location
16 of the interior route and you have also described and
17 I note now marked on the large map on the wall the
18 cross delta route.

19 THE COMMISSIONER: Excuse me,
20 what exhibit is that again?

21 MR. ANTHONY: Exhibit 60.

22 THE COMMISSIONER: 60
23 -- and what is the title of it?

24 MR. ANTHONY: It is titled
25 "Alternate Corridor Drawings" and it is the first
26 map which follows page 2 -- there are no tabs in
27 that.

28 THE COMMISSIONER: And that
29 is drawing number 4-02041014?

30 MR. ANTHONY: That is correct,
Mr. Commissioner.

Dau, Williams, Mollard, Watson
Cross-Exam by Anthony

1 Q So we have before us
2 then what we call the prime route, the interior route,
3 and the cross-delta route. Now would you also describe
4 the location -- and I'm asking you to describe it for
5 the purposes of those who don't have the map before
6 them -- the location of the Fairbanks route?

7 A I assume you're referring
8 to the total system in Alaska and Canada when you want
9 that description?

10 Q Yes, please.

11 A In the Alaskan portion
12 the route parallels the Aleyska Oil Pipeline south
13 of Prudhoe Bay to a location south of Fairbanks known
14 as Big Delta. From there that route follows the
15 Alaska Highway to Whitehorse, continuing to follow
16 the Alaska Highway past Watson Lake to Fort Nelson and
17 then from Fort Nelson or near Fort Nelson, in essentially
18 an almost direct line to a location just north of
19 Edson, Alberta, where it joins the prime route, with
20 that Fairbanks corridor there is then a line from the
21 Mackenzie Delta area, from the Richards Island to west
22 of Inuvik, then south-westerly to near Fort McPherson,
23 parallelling the -- essentially parallelling the Demp-
24 ster Highway to a location south-west of Dawson, then
25 parallelling to -- I've forgotten the highway numbers
26 in the Yukon going by Pelly Crossing and finally down
27 to Whitehorse where it joins the route I've previously
28 described.

29 Q Would you please do the
30 same description or a similar description with respect

Dau, Williams, Mollard, Watson
Cross-Exam by Anthony

1 to the Fort Yukon route?

2 A Yes, in the Alaskan port-
3 ion the route is parallel to the Aleyska Oil Pipeline
4 to a location near Galbraith Lake. It then proceeds
5 in more or less direct route to near Fort Yukon, again
6 continuing on to Dawson in the Yukon. The route
7 from the Mackenzie Delta to Dawson is as I previously
8 described it. From Dawson the route proceeds to White-
9 horse, again on the same route as the Fairbanks
10 corridor, past Watson Lake, Fort Nelson and on down to
11 Edson.

12 Q And would you also des-
13 cribe the location of the off-shore route?

14 A The so-called off-shore
15 route is on -- this is in Alaska -- it is on land
16 between Prudhoe Bay and the western boundary of the
17 Arctic National Wildlife Range. AT that location it
18 goes off-shore in the Beaufort Sea and re-enters or
19 goes back on land on the eastern boundary of that
20 range.

21 Q I gather at that point
22 it would join the prime route.

23 A Yes, I'm sorry, and
24 then joins the prime route, yes.

25 Q This does not apply to
26 the map before you, but have you also done an analysis
27 with respect to a route along the west side of the
28 Mackenzie River?

29 A Yes, those were -- that
30 was quite some time ago. At one stage in the northwest project

Dau, Williams, Mollard, Watson
Cross-Exam by Anthony

1 we did have a route that was west of the Mackenzie
2 River.

3 Q Would you describe
4 generally the location of that route?

5 A In general, a general
6 description would be from the Fort McPherson area in
7 essentially a direct line to an area near the Sans Sault
8 Rapids which is at the junction of the Mountain, and
9 Mackenzie River some 80 miles north-west of Norman
10 Wells. Then parallelling the river on the west side
11 to Camsell Bend, which is immediately west of Fort
12 McPherson -- Fort Simpson, and then it joins the
13 so called prime route near the Liard River crossing
14 shown on this particular map.

15 Q Did you also in your
16 studies consider a route along the east side of the
17 Franklin Mountains?

18 A No, we did not, except
19 in the one location north of Gibson Gap, I believe
20 we are east of the mountains a very short distance
21 there.

22 Q Now in your application
23 you discussed the question of study re-assessment and
24 evaluation, and we have considerable evidence yesterday
25 on the process basically of route selection, and I
26 don't want to repeat that but I want to make sure I
27 understand exactly as the process operates. I under-
28 stand the evidence -- please correct me if I'm wrong --
29 that the first step is what you perhaps will call a
30 map review, which then results in a strip of approxi-

Dau, Williams, Mollard, Watson
~~Cross~~-Exam by Anthony

1 mately 40-50 miles wide, an aerial reconnaissance where;
2 the major routes are flown by pipeline engineers, with the
3 result of re-defining this down to a strip of approxi-
4 mately 10 to 15 miles and then the government aerial
5 photographs and photo mosaics and the step that Dr.
6 Mollard described in detail of terrain classification,
7 and then we've heard evidence about meetings and
8 so on. That's generally the method you proceed and
9 in fact used in this route selection before, is that
10 correct?

11 A Not to that amount of
12 detail on the alternative corridors, through Fairbanks
13 and Fort Yukon, not to that degree.

14 Q I'll follow that up
15 in a moment, but in any event as far as the
16 prime route is concerned this is the procedure you
17 followed.

18 A Yes.

19 Q Now in your discussions
20 of step 1, the map classifications, you didn't refer
21 at all to the Arctic ecology map series. Were these
22 series in fact used? I am directing my questions
23 to Mr. Dau, but if someone else on the panel is more
24 appropriate to answer, I don't intend to restrict any
25 particular person.

26 A I'm sure they were used,
27 sir, but not by members of this panel. They would be
28 used by our environmental advisors. I personally did
29 not use them.

30 Q So that step 1 in any

Dau, Williams, Mollard, Watson
Cross-Exam by Anthony

1 event, the ecology map series were not part of the
2 map investigation you did at that stage.

3 A Not by me personally,
4 no.

5 Q With respect to the
6 aerial reconnaissance could you give me any indication
7 what time of the year this was done?

8 A There were many of them
9 and they were done at all times of the year.

10 Q Dealing for example
11 with the prime route, roughly how many flights' over
12 the route would be required to get the information that
13 you felt necessary?

14 A I've made something like
15 25, I'm sure Mr. Williams and the others have made
16 them. They were not all for that purpose. For instance,
17 quite frequently all of this panel has been at the
18 test site at Sans Sault and ^{if we} /wanted to go to Inuvik by
19 helicopter or charter, we would logically fly the route
20 when we did that.

21 Q And am I right in my
22 understanding that Gordon Walker was also involved
23 in these reconnaissance flights and assessments?

24 A Yes, he has been.

25 Q The next stage, the
26 question of mosaics or terrain classification, yesterday
27 Dr. Mollard gave us an interesting and enlightening
28 lecture on the terrain classification procedures, and
29 without repeating yourself, Dr. Mollard, in any
30 detail, I wonder if you could tell us which of these

Dau, Williams, Mollard, Watson
Cross-Exam by Anthony

1 techniques and the order of these techniques that you
2 followed with respect to this particular project and
3 in particular the prime route?

4 WITNESS MOLLARD: Well, I'm
5 not sure that I understand you fully here, but the
6 essence was that we examined the mosaics of a wide
7 area and then after that a route was selected and mosaic-
8 cs of the corridor were given to us and we terrain-typed
9 the window within the corridor on those mosaics.

10 Q Well, for example, you
11 discussed the use of the earth's satellite. Was that
12 in fact used in the selection of --

13 A No, it wasn't used in the
14 selection, and the first satellite picture, I think,
15 was in July 25, 1972, and of course our route studies
16 started in 1969. I used that just as an example of what
17 a mosaic looks like at that scale.

18 Q Thank you . Now, I'm
19 correct in my understanding that in fact you were
20 given a route within which to do the terrain classi-
21 fication. Now could you tell me which of the routes
22 that we've outlined briefly, in fact you did terrain
23 classification in addition obviously to the prime
24 route and the interior route?

25 A Yes, you mean how many
26 routes have I done terrain classification on?

27 Q Well, we've identified
28 I believe, seven different routes which Mr. Dau
29 described --

30 A Yes.

Dau, Williams, Mollard, Watson
Cross-Exam by Anthony

1 Q -- in some detail. I was
2 wondering about those. Could you tell us
3 which ones you did, the type of terrain classification
4 you've referred to in respect to the prime and interior
5 route?
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Dau, Williams, Mollard, Watson
Cross-Exam by Anthony

1 A I did the terrain typing
2 on the route that Mr. Dau described last that was on
3 the west side of the river, and was west of Camsell
4 Bend, and came across the Peel Plain and also, of
5 course, on the prime route and on the coastal route
6 and on the cross-delta and on the Fort Simpson alter-
7 nate , and I think I did a study of the warm oil line
8 too which went on the east side of the river.

9 MR. ANTHONY:

10 I'm wondering if my
11 friend can help me? I don't think we have that
12 terrain classification beyond the interior or the
13 interior route and the prime route. I wonder if my
14 friend could tell me ^{whether} that information will be
made available to this Inquiry?

15 MR. GENEST: I will have to
16 advise you on that, Mr. Anthony. I don't have that
17 at my fingertips, sorry. I'll make a note of it.

18 MR. ANTHONY: Well, perhaps
19 we know that the material is available. Are you going
20 to discover whether or not you're prepared to give it
21 to us, or is it just a question of time?

22 MR. GENEST: Mr. Marshall
23 may be of more help.

24 MR. MARSHALL: I believe, Mr.
25 Anthony, we ~~may~~ have listed some of those reports in
26 the various studies of Dr. Mollard that have been
27 contained in the list of reports filed by Arctic
28 Gas. I can check through these, if you like, and
29 identify those. If there are any additional ones
30 pertaining to this subject, work that was done for

Dau, Williams, Mollard, Watson
Cross-Exam by Anthony

1 Arctic Gas, we can identify those for you.

2 MR. ANTHONY: Q Mr. Mollard,
3 if I may make just one further point. I believe in
4 your evidence yesterday you stated that your job is
5 to do the terrain classification, and to provide this
6 information in an understandable form to the Gas
7 Pipeline engineers who are responsible for the selection
8 of the route; is that accurate?

9 A Yes, they first selected
10 the route that I terrain^{typed} and then I think they
11 selected a route within the terrain typed area.

12 Q Your end product, if I
13 may put it that way then, is^a mosaic or terrain classi-
14 fication within a route that is more or less of a re-
15 port to Mr. Dau's example of Northern Engineering
16 Service.

17 A I think maybe you're
18 referring to my opening statement there, but really
19 the bounds of my work primarily were to identify and
20 classify and map the terrain, and beyond that of course
21 I had discussions with the client, but essentially at
22 the mapping stage, that was the essential end point of
23 most of my input.

24 Q Well, I think it seems
25 clear from your evidence that your information is
26 very important to the work that has been done by Mr.
27 Dau in Northern Engineering Services as far as the
28 route is concerned. Could you please tell me as to
29 how you know what exists beyond the terrain classific-
30 ation strip that Dr. Mollard provided us?

Dau, Williams, Mollard, Watson
Cross-Exam by Anthony

1 A I think we mentioned,
2 I know we mentioned yesterday that Dr. Mollard had
3 obtained some small-scale photography and prepared
4 mosaics to the scale of approximately ten miles to
5 the inch over the Mackenzie Valley and the Arctic
6 coast. These are mosaics of some 10 to 12 inches
7 wide, which means that the width of photography at that
8 scale is some 100 to 120 miles, perhaps. The next
9 stage is the utilization of existing government
10 photography which is at varying scales, and I believe
11 I mentioned that these individual photographs were
12 terrain typed. The photo -- one individual photo can
13 cover an area from 4 to 9 miles, in many instances
14 there were parallel lines of photography and that
15 strip would be wider.

16 The third stage that Dr.
17 Mollard worked on was then the window that appears
18 in the alignment sheet which I think is -- which is
19 2 1/2 miles wide.

20 Q The detailed geotechnical
21 data that has been referred to in the application, re-
22 fers to that band within which Dr. Mollard has done
23 the detailed terrain analysis. Is that accurate?

24 A Yes, there's other
25 information available, obviously, by people who are
26 working in that area, but you are correct, yes.

27 Q With respect to the
28 question of field studies, could you tell me where
29 in the process these were done? For example, the
30 test hole drilling, was that done before or after the

Dau, Williams, Mollard, Watson
Cross-Exam by Anthony

1 terrain classification done by Dr. Mollard?

2 A Yes, well that's a
3 simple thing because starting back in '69 there was
4 drill hole data available shortly after we got into it,
5 and the drill hole data being obtained, I think, right
6 now probably, so one has to think of maybe the bulk of
7 a lot of the seven or 8,000 drill holes, you might
8 say, that have been looked at, and I'd say that most
9 of that of course came after the Mackenzie Valley
10 Highway and the granular materials inventory work was
11 done by the government, but if I'm right in my memory
12 I think Mackenzie Valley Pipeline drilled about 780
13 some drill holes and the Arctic Gas and its predecessors
14 drilled about 780-some holes, so those are distributed
15 over time and -- but of course the ones from the
16 Department of Public Works would only be available after
17 they started the highway.

18 Q Setting aside the 780
19 done by Arctic Gas, the large number, the 7,000 in the
20 evidence yesterday
21 / by the Department of Public Works, these were
22 done in relation to the Mackenzie Highway, were they?

23 A Yes, I believe so.

24 Q They then don't necessarily
25 follow the proposed pipeline route.

26 A No, I've seen summaries
27 of that data and so I don't want to be -- try to be
28 too specific because, I think, it was my impression that
29 the summaries of the drill hole log data that I've
30 studied and correlated with topography that I mentioned
falls within the window of the mosaic sheet.

Dau, Williams, Mollard, Watson
Cross-Exam by Anthony

1 Do they all -- I thought
2 that they all fell within the window but I'm not
3 100%.

4 Q I would suggest that
5 that's not true.

6 A Mr. Williams says no,
7 that they didn't fall, all fall within the window.

8
9 Q In any event, I gather
10 from your evidence that -- and your answers to Mr.
11 Gibbs this morning -- that the test hole data is
12 a significant component of route selection.

13 A Yes, it is. There's
14 a long answer to that and I won't go into it because
15 it depends on stages of -- and the type of route and
16 they're all different, and how confident you are and
17 how fast the project has to be built and how much
18 money is available. There's a dozen things. We look at
19 them all differently and we're working every day on
20 routes, and so you know, on this particular route I
21 would say it was most helpful.

22 Q Well, I see in the
23 material filed yesterday about the alignment sheets for
24 the proposed change around Fort Simpson, that there
25 are virtually no test holes drilled along that route.
26 I think there are four at a portion where it gets
27 close to where you were before. Now could you explain
28 how you could propose a route without doing these
29 test hole drillings, or are they irrelevant to your
30 considerations?

Dau, Williams, Mollard, Watson
Cross-Exam by Anthony

1 A Well, I think, of course,
2 that things go on, I'm not to say about that, but they
3 will be drilled. Now we're doing a road location right
4 now where there isn't a drill hole on it, and we're
5 saying it must be within 50 feet of our line, so it
6 depends a great deal, each one varies. But I think
7 the point is that we haven't looked at drill hole
8 data, we don't have any drillhole data in that.

9 Q It's fairly difficult
10 then to find out where the raisins are in your cake.
11 I wonder, perhaps, Mr. Dau, if you could enlighten us
12 as to the sorts of studies done with respect to the
13 routes that you've identified? I think you've identi-
14 fied the fact that there are map studies, aerial
15 reconnaissance, test hole data, mosaics with terrain
16 classification, and field studies. Now I assume that
17 all these were done with respect to the prime route,
18 is that correct?

19 MR. DAU:

20 A Yes.

21 Q And were these also all
22 done with respect to the interior route? Interior
23 alternatives.

24 A It is the same level
25 of detail on the interior route, yes.

26 Q Now with respect to the
27 proposed change around Liard, we've identified -- we
28 didn't have the test hole information, were map studies,
29 I assume, were done on that proposed route?

30 A Yes.

Dau, Williams, Mollard, Watson
Cross-Exam by Anthony

1 Q Aerial reconnaissance?

2 A Yes.

3 Q And terrain classification?

4 A Yes.

5 Q And field studies?

6 A Field studies are to be
7 done. The field studies are the drilling.

8 Q May I just perhaps clarify
9 in my own mind, do you do anything else when you do
10 actual-- depend on the actual route besides the test
11 hole drilling, are any other studies done?

12 A No. One moment, please.

13 I might add, sir, that we probably have not explained
14 in enough detail how the actual route is located.
15 by the location engineer, utilizing all the information
16 that is available to him. For instance, we -- once the
17 air photos are obtained, they are studied in a stereo-
18 scope, as Dr. Mollard showed the other day, and the
19 location engineer is using the information that's
20 available to him, which is the terrain typing. In the
21 stereo study of the pictures, he gets an impression of
22 the terrain, the topography. He gets an impression of
23 the tree cover, the vegetation. We have obtained slopes
24 along the route in a working paper form. The geotechn-
25 ical panel can discuss what types of slope we have.
26 We don't want to leave the impression that Dr. Mollard
27 -- we look at it from maps, we go out and fly the
28 pipeline, and Dr. Mollard does terrain typing, we draw
29 a line down the centre of the mosaic. That isn't what
30 happens at all. There's an awful lot of work goes on

Dau, Williams, Mollard, Watson
Cross-Exam by Anthony

1 in the detail location. These are quite precise
2 from stereo study.
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1 Q Just to clarify in my
2 own mind, the pipeline location engineer is in fact
3 yourself or NORthern Engineering SERVICES?

4 A That is right, mm-hmm.

5 Q Could we then discuss
6 the cross-delta proposal which you have on -- could
7 you tell me whether map studies were done of that?

8 A Yes.

9 Q Aerial reconnaissance?

10 A Yes.

11 Q Test hole drilling?

12 A Yes.

13 Q Mosiacs and terrain
14 classification?

15 A Yes.

16 Q And any field studies
17 beyond the test hole drilling?

18 A That is the field study
19 sir.

20 Q What about the FAirbanks
21 route, were map studies done of that area?

22 A A map study --

23 THE COMMISSIONER, EXcuse me,
24 before you leave the cross delta route, you told
25 us yesterday I think, Mr. Dau, Or -- that the
26 cross delta route was one that came under serious ex-
27 amination or at least was given serious consideration
28 as the result of some tests the producers had carried
29 out in the delta -- is that correct or did I mis -
30 understand you?

Dau, Williams
Mollard, Watson
Cross-Exam. by Anthony

1841

1 A No, sir, that is correct
2 in the sense of environmental studies. I think what
3 I said was that several years ago when it was
4 suggested at that time, everyone was under the impres-
5 sion that it was a very sensitive area from an
6 environmental viewpoint and that the producers/^{who}were
7 working in the area, have conducted many environmental
8 studies and once those were examined it was determined
9 that that particular area of the Delta was not as
10 sensitive as first thought, and because of that
11 reason, we then went into determine what difficulties
12 there might be in Shallow Bay crossing and the
13 channel crossings and that resulted in some field
14 programs which essentially were drilling over two
15 winter seasons -- it is obviously much better to drill
16 in the winter if possible and a fair amount of work
17 on river studies in which -- the next panel could
18 discuss those in detail.

19 THE COMMISSIONER: Is this
20 current winter season, the second winter season?

21 A Yes, we have just fini-
22 shed some information and I believe that we have
23 a program on now. I am corrected -- it was a winter
24 and a summer, sir. But we have just --

25 THE COMMISSIONER: Sorry,
26 last winter and last summer?

27 A Yes.

28 Q Well, are we into the
29 second winter or is this the first winter?

30 A The next panel could

1 answer in complete detail as to what those programs
2 are, sir and I believe that we have some underway this
3 winter.

4 Q The next panel is geo-
5 technical --

6 A Yes, sir.

7 Q Well, you are not sure
8 then whether when you said two winters -- you were
9 talking about last winter and this winter or
10 whether this winter constitutes the only winter work
11 that has been done at all --

12 A No, it is the previous
13 winter, not just this winter -- I am not sure
14 whether -- how much work was done early in this winter.
15 That is my problem.

16 MR. ANTHONY:

17 Q You mentioned just
18 a moment ago, in responding that you -- with respect
19 to the cross- delta route, you had further environ-
20 mental information, in particular I assume from the
21 Delta producers. Now, as you are aware of course,
22 the Delta producers have filed certain materials with
23 the Government of Canada, is this the material, the
24 information that you were provided with that enabled
25 you to make the determinations on the cross-delta
26 route you did?

27 A No, sir, I have
28 not seen that information, but this environmental
29 information that was obtained from the studies by
30 the producers was obtained some time ago and again

1 the environmental panel would be the one to respond to
2 questions concerning the environmental information
3 that was obtained from the producers.

4 Q And I gather then from
5 my friend that this information that you are now iden-
6 tifying from the producers will be presented to this
7 Inquiry.

8 MR. GENEST: We propose to
9 file a list of all the -- everything we have in connec-
10 tion with the cross-Delta route. It is in the course of
11 preparation now and I am told -- while I am on the
12 subject -- that we are very hopeful of having the
13 alignment sheets for the cross-Delta route available
14 by the end of next week. Now, I am relying there on
15 the printer's promise and it is subject to the vagaries
16 of printers, but --

17 THE COMMISSIONER: As long as
18 you do not put it in the mail.

19 MR. GENEST: We will see that
20 it is carried by courier so that you will at least
21 have a detailed alignment sheets of the cross-Delta
22 route by the time you are headed to Aklavik and
23 hopefully by the end -- before these formal -- this
24 phase of the formal hearing comes to an end.

25 MR. ANTHONY: Thank you,
26 perhaps we could go back to the line of questioning
27 we have pursued earlier.

28 Would you describe the
29 tests then done for the Fairbanks corridor?
30 That study done of that route?

1 A There were no tests on
2 the Fairbanks corridor. The map studies yes.

3 Q There were map studies
4 done. Was there aerial reconnaissance of that area?

5 A Yes.

6 Q And you say that
7 there were no field studies. Was there a terrain
8 classification, a mosaic done of that route?

9 A No.

10 Q Are there reports avail-
11 able on the result of the aerial reconnaissance?

12 A No.

13 Q Do you know when this
14 aerial reconnaissance was done and by whom?

15 A I did part of it
16 myself, Mr. Williams has done some, it has been done
17 by many people over several years in time. The in-
18 formation for a study like that is -- it is not
19 necessary to say, "Okay I am going to look at it and
20 get an airplane and fly it." There are people who
21 have seen it for different purposes at different
22 times. We did not duplicate that.

23 Q But the aerial reconnais-
24 sance that I was referring to was flights for purposes
25 of evaluating the route in the context of route
26 selection and your advice is that there were
27 these sorts of flights done.

28 A That is correct. Not
29 a specific flight that started from point A and
30 went to point B.

1 Q Would you know describe
2 the Fort Yukon route. Were map studies done of
3 that?

4 A Map studies.

5 Q Aerial reconnaissance?

6 A Yes.

7 Q Are there reports available
8 of aerial reconnaissance over that route?

9 A No.

10 Q Any test holes or field
11 studies?

12 A No.

13 Q Any mosiacs or terrain
14 classifications?

15 A No.

16 Q Would you describe
17 next the west side of the Mackenzie. Were there
18 map studies done of that route?

19 A yes.

20 Q Was there aerial recon-
21 naissance of that route?

22 A Yes.

23 Q And the reports are
24 available of that aerial reconnaissance?

25 A I am not sure. There
26 may be -- they would be very old. I am just not
27 positive. I do not know.

28 Q Perhaps I could discuss
29 this matter further with Mr. Marshall, Mr. Genest.

30 Test hole studies?

Dau, Williams
Mollard, Watson
Cross-Exam by Anthony

MR. MOLLARD:

A Yes, there were test

holes across the Peel plain and the Peel plateau and
a few down the west side, but fairly limited as I
recall.

Q Mosaics or terrain classi-
fication?

MR. DAU:

A Yes, that was done.

Q And I believe that your
evidence was that as far as the east side of the
Franklin Mountains there were no studies done at all
with respect to that route?

What is the
answer to that?

A The answer is no.

Again though I must remind you for that very narrow
section north of Gibson Gap where the prime route is
east of the mountains. --

MR. ANTHONY:

Q That is work done in
relation to the prime route?

A That is correct.

Q Yesterday you described in
a number of criteria that you applied in determining
route selection and you outlined a number of them and
Mr. Gibbs suggested some additions this morning and
I do not think that anything is gained by drawing up
a long list of matters that you consider, but I would
like to go slightly further and invite you to agree
with me that there are other valid criteria that you

1 would recognize as part of your operations as being
2 both significant and valid in the sense that they
3 should be taken into account in the question of route
4 selection. I would perhaps adopt your suggestion in
5 your evidence of all other factors being equal, just
6 to isolate the criteria, but I have done this in
7 the context of technical and economic and social and
8 environmental and under the first would you agree that a
9 factor in the route selection would be the existence of
10 pre-existing research available in a particular area?

11 A That would be of
12 value to us, yes.

13 Q That would be the
14 sort of information that Dr. Mollard referred to
15 with D.P.W. drillings done or the Department of High-
16 ways?

17 A Yes.

18 Q Would you also agree
19 that fulfillment of the Northern Pipeline Guidelines
20 issued by the Government of Canada would be a factor
21 in route selection?

22 A Yes.

23 Q I had a list of
24 economic, but I believe that you have in fact adopted all
25 of those, however, none of mine under the heading
26 of Socio-environmental, so perhaps I will go to that.
27 Would you also agree that the need to insure a proper
28 interrelationship with other systems, other transpor-
29 tation systems is a valid criteria in determining
30 pipeline route selection?

Dau, Williams
Mollard, Watson
Cross-Exam by Anthony

1848

1 A Other transportation
2 systems in the sense of a barge system on the
3 river or a highway or that type of thing?

4 Q Yes.

5 A Yes.

6 Q And the need to avoid
7 rare and endangered species of wildlife?

8 A Yes, those are --
9 that is correct, yes.

10 Q And the need to avoid
11 if possible existing potential wildlife reserves,
12 parks and so on?

13 A Yes.

14 Q In fact the need to
15 avoid ecologically sensitive areas?

16 A Where possible, yes.

17 Q The need to avoid
18 interference with traditional pursuits of hunting,
19 fishing and trapping?
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Dau, Williams, Mollard, Watson
Cross-Exam by Anthony

1 A Where possible, yes.

2 Q And the need perhaps to
3 avoid sensitive areas at critical times -- migration
4 routes, staging and nesting areas, and things of
5 this nature.

6 A Yes, where possible.

7 Q I would assume, of
8 course, that you'd be having constant information
9 available of recent studies and published research
10 dealing with identification of these various issues

11 A Yes.

12 Q If I may deal for a
13 moment with the issue of the inter-relationship of a
14 gas pipeline with other systems that you've identified.
15 Could you tell us what information you had in determin-
16 ing this route selection about the likely location of
17 any other transportation system?

18 A Well, we obviously had
19 the information on the location of the barge system
20 on the Mackenzie River.

21 Q That's one for you.

22 A We had constant, many
23 contacts with the Department of Public Works on the
24 location of the proposed Mackenzie Highway, and we
25 continually are dealing with them on their re-location
26 and the same would apply on the Dempster Highway where
27 it affects -- or where we are close to their location.

28 Q Could you tell us what
29 information you had about the likely location of a
30 railroad?

Dau, Williams, Mollard, Watson
Cross-Exam by Anthony

1 A I had no information
2 other than the published reports that are published
3 information I've seen, which is a line on a map.

4 Q I wonder if you could
5 be a little more specific on the -- either the report
6 or the information so that we can identify the sort of
7 information you had available to you in the ques_tion
8 of route selection?

9 A I recall reading a
10 publication by the B.C. Government at one time which
11 suggested a railroad to the north, and I can recall
12 some articles in trade journals that did include a
13 map. I had no knowledge of, you know, a rather specific
14 route location for a railroad. Maybe Mr. Williams
15 could respond to some of this.

16 WITNESS WILLIAMS: I recall
17 reading a report on the corridor by Pemcan, that I
18 think maybe included in our list that was done three
19 or four years ago. I've really forgotten what all
20 it dealt with, but I did read it at the time.

21 Q Could you tell us what
22 information you had about the likely location of
23 a hot oil pipeline?

24 WITNESS DAU: The only infor-
25 mation we had was the information that's been published
26 by Mackenzie Valley Pipeline Research.

27 Q Perhaps I could deal
28 with the highway issue for a moment. In response to,
29 or as part of your evidence which was in response
30 to the pipeline application assessment group questions,

Dau, Williams, Mollard, Watson
Cross-Exam by Anthony

1 you discussed the question of highways, and I'm not
2 exactly sure what policy was adopted by you in relation-
3 ship to the highway. Did you adopt any policy with
4 respect to your location either near or away from a
5 highway, or what policy generally was adopted in respect
6 to that?

7 A The first thing was to
8 eliminate as many pipeline crossings of the highway
9 as possible. Then secondly, to have spacings that would
10 not be on the order, you know, something on the order
11 of 500 feet, not less than 500 feet. Now I recognize
12 that some of the alignment sheets probably show it
13 closer than that. The point I was trying to make is
14 that there will be, in my view, minor re-locations that
15 will widen that spacing. The problem we have, of course,
16 is that the first information we had on the Mackenzie
17 Highway gave us a location. It's constantly being
18 moved, and we, you know, we have trouble keeping up.
19 We had to fix something at some time, and rather than
20 try and change the latitudes we just left it as it
21 is and recognized that there will be changes.

22 Q Well, you're not alone
23 in attempting to track down the elusive Mackenzie
24 Highway, but perhaps you could give us an indication
25 of what your current understanding is of the location
26 of the highway, and the information you had, the
27 discussions you've had with the Department of Public
28 Works.

29 WITNESS WATSON: It is my
30 understanding that the Mackenzie Highway is currently

Dau, Williams, Mollard, Watson
Cross-Exam by Anthony

1 being reviewed geotechnically and environmentally, and
2 that it is located -- this location, as I understand
3 it, could change as a result of these reviews which are
4 going on at the moment.

5 Q I wonder if you could
6 refer us to either a map or drawing or something which
7 has on it the location of the Mackenzie Highway as
8 you understand it at present, even aside from the
9 fact of who knows what will happen next week?

10 A Our alignment sheets
11 filed has the location of the Mackenzie Highway and
12 that was the location of the highway as we understood
13 it when the filing took place.

14 Q I'm wondering if you have
15 any information more current than that, going on with
16 what Mr. Dau said about the continual changes.

17 A I have the set of
18 alignment sheets here which have summary locations of
19 the highway marked on them. There is only one set and
20 it doesn't include all of the re-locations.

21 Q Could you tell us what
22 understanding you had with respect to the timing for
23 construction of the highway?

MR. DAU:

24 A Only what we've read in
25 the press, which as I understand it, will be extended
26 to Fort Good Hope. I better withdraw that.

27 Q Welcome to the club.
28 Do you -- and I know that in the construction phase
29 you may be a little bit more involved in this issue --
30 but could you tell us generally what route selection

Dau, Williams, Mollard, Watson
Cross-Exam by Anthony

1 you expect to make of the Dempster Highway?

2 A With respect to route
3 location?

4 Q Yes, in deciding where
5 you will locate your prime route, you had to assume
6 information about the location of the Dempster Highway.
7 Did that affect in any way the location of the prime
8 route?

9 A I don't think so. It
10 had essentially no effect on our route location. It
11 only deals with a very small part of the route.

12 Q During this process of
13 route selection, did Arctic Gas or did Northern Engineer-
14 ing Services hold meetings with government personnel
15 about possible routes?

16 WITNESS WILLIAMS: Would you
17 repeat the question, please?

18 Q During the process of
19 route selection, did Arctic Gas hold any meetings
20 with the Federal Government of Canada personnel with
21 respect to routes?

22 A I recall attending a
23 meeting in Ottawa with personnel from Canadian Arctic
24 Gas. I think it was maybe John Fyles can refresh
25 my memory but it must have been about three years ago,
26 where, among other things at that time, the Fort Simpson
27 situation was raised. I think there was some discussion
28 about the highway location at that time. It's so long
29 ago I've forgotten the details. In addition to that,
30 of course, we had several meetings with the D.P.W.

Dau, Williams, Mollard, Watson
Cross-Exam by Anthony

1 personnel in Edmonton with respect to details of the
2 Mackenzie Highway location that Mr. Watson mainly
3 attended.

4 Q Well, the meeting des-
5 cribed with respect to Mackenzie Highway and so on,
6 did that meeting also deal with the question of route
7 selection for a gas pipeline?

8 MR. DAU:

9 A They were interested in
10 knowing what our route was, but certainly no direction
11 from any government personnel as to their opinion of
12 where we should be, you know.

13 Q Did the government at
14 any time lay down any guide-lines in meetings with
15 Arctic Gas or its predecessors as to what routes were
16 acceptable to it?

17 MR. GENEST: I think that
18 you're referring to this panel's knowledge?

19 MR. ANTHONY: Well, the panel
20 is here on behalf of Arctic Gas telling us what routes
21 they selected and I would assume that if there were
22 any guide-lines, instructions, formal or informal by
23 the government on route selection, this panel would
24 know about it.

25 A Just the guidelines that
26 you previously referred to that were published. I'm not
27 aware of anything else.

28 Q Would anybody else
29 within Northern Engineering Services or Canadian Arctic
30 Gas be the recipient of this sort of direction other
than this panel?

Dau, Williams, Mollard, Watson
Cross-Exam by Anthony

1 A Not within Northern
2 Engineering. I can't speak for Arctic Gas.

3 Q One particular meeting
4 which Mr. Williams referred to one particular meeting
5 which I would suggest would be the meeting in May of
6 1972, is that approximately right, to your recollection?

7 WITNESS WILLIAMS: Yes, I
8 think that is correct. That was just shortly before
9 the merger of Gas Arctic system and the Northwest
10 project.

11 Q Except for that meeting
12 you are aware of no government direction as to where
13 your pipeline route should go?

14 MR. DAU:

15 A I don't recall receiving
16 any direction at that meeting. It was open discussion.
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Dau, Williams, Mollard, Watson
Cross-Exam by Anthony.

1 Q I'm sorry, I thought I
2 had the specifics to it, I believe, the 1972 pipe-
3 line guidelines. Mr. Dau, as you have previously
4 said, you were aware of the 1972 pipeline guidelines
5 which I don't have a list, I believe it's Exhibit 2 in
6 these proceedings, and I refer you to page 9 which has
7 the following on it:

8 "1. The Government of Canada is prepared to
9 receive and review applications to construct one
10 trunk oil pipeline and/or one trunk gas pipe-
11 line within the following broad corridor:

12 (i) Along the Mackenzie Valley region in the
13 broad sense from the Arctic coast to the Provin-
14 cial boundary.

15 (ii) Across the northern part of the Yukon Territory
16 either adjacent to the Arctic coast or through
17 the northern interior region from the boundary
18 of Alaska to the general vicinity of Fort McPherson
19 and thus to join the Mackenzie corridor."

20 Now would you tell me what your understanding of those
21 government guidelines are on page 9 of the 1972 guide-
22 lines?

23 A My understanding of what
24 you just read to me, sir?

25 Q Yes, your understanding of the
26 guidelines.

27 A Well, it describes the
28 route we've applied for. We're within those guide-lines.

29 Q In fact, they were
30 directions from the government to consider those
two areas for a pipeline route.

Dau, Williams, Mollard, Watson
Cross-Exam by Anthony

1 A Yes, I guess that's --

2 Q So in fact from the time
3 of those guidelines in any event, it really didn't do
4 much use for you to study for example the Fairbanks
5 corridor.

6 MR. GENEST: Mr. Commissioner,
7 it seems to me that that's argumentative.

8 MR. ANTHONY: Well, sir, I
9 think it's a question of how the route was selected.
10 If it's the tone of the question, I'm prepared to
11 amend it. I am really trying to get an understanding of
12 what directions this panel understood were given
13 as to the locations that the government would consider
14 in any application.

15 THE COMMISSIONER: As of
16 June 28, 1972 when these expanded guidelines for
17 northern pipelines were tabled in the House of
18 Commons by Mr. Chretien, the directions or the guide-
19 lines that you've just read out, Mr. Anthony, would
20 be apparent to all of Canada, including presumably
21 Arctic Gas. I don't think that there's a great deal
22 to be gained by asking the witness what he understood
23 these guidelines meant.

24 MR. ANTHONY: I'll refrain
25 from any question, pursuing one issue of the people
26 in Canada knowing what the guidelines are; but I would
27 -- am I correct in then assuming or in stating that
28 Arctic Gas, from the time of the issuance of the guide-
29 lines concentrated its route selection within the two
30 broad corridors there defined?

Dau, Williams, Mollard, Watson
Cross-Exam by Anthony

1 A A route was essentially
2 fixed before the guidelines came out. There have been
3 refinements since then.

4 Q I see, so it was a happy
5 coincidence that the government guidelines followed
6 exactly the route that you had already selected, is
7 that it?

8 A I wouldn't say that.
9 These are, in my view, about the only logical corridors
10 that there are.

11 Q Without going any
12 further, I would assume then you would have adopted
13 Mr. Gibbs' argument this morning that in fact item 10
14 of political and regulatory factors were one of the
15 prime criteria in selecting the route at this stage.

16 A The route was selected
17 before these guidelines were issued. General route.

18 Q And the only evidence
19 was, meeting you had with respect to government
20 direction prior to the official promogation of these
21 guidelines was the meeting which Mr. Williams referred
22 to.

23 A That's all I'm aware of,
24 sir.

25 Q Mr. Dau, at various
26 stages in the application we have the assertion by
27 Arctic Gas that the prime route, as presented by them
28 is in the "public interest". I would, without getting
29 into detailed analysis or the evaluation of these things
30 I would anticipate, and I would suspect you'd agree,

Dau, Williams, Mollard, Watson
Cross-Exam by Anthony

1 that it is in fact a consideration of the various
2 criteria that a company would come to that conclusion,
3 factors such as the interior route is longer and
4 crosses more mountain ranges which makes it more
5 expensive to construct, that the prime route would have
6 the least adverse effects on wildlife, soil, vegetation,
7 because it is shorter, less demand on soil
8 or gravel requirements and so on. Taking these
9 together, is that correct?

10 MR. GENEST: I think that I
11 submit that that question is impossible to answer,
12 that it starts with the assumption of a statement, that
13 this witness has not yet made, that it's in the public
14 interest. That's a submission of Arctic Gas and this
15 witness, in my respectful submission, is in no position
16 or his judgment on what is in the public interest is
17 something for you and for the Energy Board to make.
18 So I object to the question.

19 THE COMMISSIONER: Mr.
20 Anthony, Mr. Genest is right. It is not appropriate
21 for you to ask Mr. Dau or any of his colleagues what
22 the public interest means.

23 MR. ANTHONY: Well, perhaps
24 since we found out yesterday that Mr. Horthy will be
25 giving evidence before us, I will perhaps will defer
26 that question until we have an opportunity. I
27 think it's certainly a proper question since that is
28 the argument raised by Arctic Gas in its application
29 as the justification or the reason for supporting the
30 prime route, and if that's in fact their argument -

Dau, Williams, Mollard, Watson
Cross-Exam by Anthony

1 THE COMMISSIONER: You
2 wouldn't suggest that it wasn't in the public interest?

3 MR. ANTHONY: Well, I was
4 very interested in perhaps discerning the distinction
5 between the Arctic Gas's interest and public interest,
6 but I shall leave that until I have Mr. Horthy.

7 THE COMMISSIONER: You can
8 pursue by cross-examination in the usual way, going to
9 matters of fact.

10 MR. ANTHONY: I will defer
11 that matter to a later stage.

12 Q Yesterday in the evidence
13 that was provided, we discussed questions of what
14 you defined as final design changes, and it's my
15 understanding of that evidence -- and please correct
16 me if I'm wrong -- is that this process of changes are
17 then within the strip of terrain analysis and ^{basic} environ-
18 mental information that you have. Is that correct?

19 A To a very large degree.
20 I can, for instance, visualize a situation where there could
21 be a re-location that could be beyond the so-called
22 window in the alignment sheet, and let me give you an
23 example. If in fact we have located a pipeline
24 between the Mackenzie River and the proposed highway,
25 and the highway changes its location closer to the
26 river, which means we have to move, the pipeline has
27 to move, in that instance it may mean that we would
28 be off that alignment sheet, in which case we would
29 have to prepare additional information on a new
30 alignment sheet covering the new area.

Dau, Williams, Mollard, Watson
Cross-Exam by Anthony

1 Q I gather from the
2 evidence that there will be these minor alignment
3 changes made in the field as you proceed with more
4 detailed analysis. Is that right?

5 A Well, the changes aren't
6 made in the field. We gather field information and
7 it's a matter of design, which is an office design, to
8 determine the proper location. There are circumstances
9 where there are very minor re-locations in the field
10 as you get information during the --just prior to
11 construction. But those are very minor, mind you.

12 Q This in fact, these
13 sorts of changes could occur after construction had
14 commenced and before in fact the route had approached
15 the particular problem, denning site, archeological
16 site and so on.

17 A Yes, that's right.

18 Q So in any event at that
19 stage your changes would be confined to within the
20 window, as you described it.

21 A At that stage, yes.

22 Q I wonder if I could
23 turn briefly to the Liard crossing changes that were
24 proposed and filed yesterday? I gather from an
25 answer to a question to the Commissioner this morning,
26 this route change has been considered for about a
27 year's time. Now I wasn't exactly sure in the evidence
28 that was presented yesterday what were the considerations
29 that were paramount in your mind or the mind of
30 Northern Engineering Services, that resulted in this

Dau, Williams, Mollard, Watson
Cross-Exam by Ant hony

1 change in alignment? What were the problems that were
2 encountered or discovered or were so great that you
3 wished to change the routing in that dramatic fashion?

4 A Are you talking about
5 Fort Simpson, sir?

6 Q Yes, Fort Simpson.

7 A Well, I can only repeat
8 the information I gave yesterday, which ^{the} Fort Simpson
9 route revision results because of the decision to
10 install dual crossings in the major rivers. Once that
11 decision was made, it swung the balance from west of
12 Simpson to east of Simpson. Doing that we of course
13 dropped the Liard River crossing, we still have a dual
14 crossing across the Mackenzie, but at the location we
15 have now the river is obviously smaller as far as water
16 holes are concerned, because it's above the confluence
17 with the Liard. It's not subject to the same type of
18 flooding because the Mackenzie comes from a lake and
19 it doesn't have the dramatic changes in depth that the
20 Liard has, in flood stage.

21 Q Was this information
22 that you -- resulted in the route change made available
23 to you after the original filing that showed the
24 line to go across the Liard, provided in the initial
25 application?

1 A Yes, the decision to dual
2 the crossings came after the first filing, yes.

3 Q Well, in your evidence
4 you stated that you considered various elements
5 including problems of river crossing, muskeg terrain
6 and so on and having considered that decided to make
7 the proposed change around Fort Simpson. I was wondering
8 if that information came to you following the filing of
9 the initial route or prior to establishing the initial
10 route?

11 A At the time of the
12 original filing the major river crossings were
13 single crossings. I am not sure I have responded to
14 your question because I do not quite understand what
15 you are getting at, but at that time we had concluded
16 that the original route we filed was the proper route.
17 Once the decision was made to twin the crossings,
18 we then re-examined the problem and then came to
19 the conclusion that we should move east to Fort
20 Simpson. I believe that Mr. Williams mentioned some
21 time ago that this has been discussed for some
22 time.

23 Q Perhaps you could
24 explain it to me the significance of the -- or the
25 logic behind this twin pipeline. I understand in
26 your evidence yesterday that the second line is a
27 matter of insurance as I think in response to Mr.
28 Genest's comment.

29 Now, in a twin line crossing,
30 could you tell me the relative location of the two

1 lines, is one deeper than the other or is it just
2 farther away or what is the significance of that?

3 A I can respond to that
4 in general terms. The next panel can deal with it in
5 detail. The lines across the river are separated
6 by approximately one river width. In other words,
7 east of Simpson, if the river crossing is, say,
8 3,000 feet wide, the two lines are separated by
9 about that distance, and the technical reasons
10 for doing that -- the next panel could respond to
11 those.

12 Q Using the change then
13 at Fort Simpson and plus the examples that you raised
14 in your evidence yesterday about changes, am I correct
15 in my understanding then that there are really no
16 sections of the route that are so permanently fixed
17 that a change would be impossible?

18 A I would hope not.
19 I think the detailed information that we gather
20 prior to construction, if it results in any change,
21 it is a change to improve the situation. It improves
22 it from a stability point of view, from erosion,
23 from any point of view -- it is a safer, more secure
24 pipeline.

25 Q I just have a few short
26 questions then about the compressor station location
27 and design. I believe that your evidence was that
28 they can be relocated for a half mile without
29 significantly affecting the throughput and up to four
30 miles if necessary, is that correct?

1 A That would be a very
2 special case on the four miles.

3 Q Now, could you tell me
4 at the locations of the compressor station, how
5 much of the pipe is above ground?

6 A I do not have that
7 detail -- it would be very insignificant -- it would
8 be something on the order of a few hundred feet, I
9 would think.

10 Q Perhaps my friend could
11 enlighten me on the basis of evidence that will be
12 forthcoming in other panels. I have some questions
13 about the security of the pipe and generally the
14 of the compressor station facilities and so on,
15 would this -- Mr. Dau be able to enlighten us on these
16 questions?

17 MR. GENEST: There will be
18 the geotechnical group to be followed by the design
19 group who are equipped to deal with that kind of
20 question.

21 MR. ANTHONY: Well, then
22 perhaps these further questions about the actual,
23 location, size and the pipe above ground should be
24 deferred to that group, would that --

25 Q Another question.
26 the application before us is for a right-of-way of,
27 I believe 120 feet, is that correct?

28 A Yes.

29 Q Could you tell me why
30 this particular width is required?

Dau, Williams
Mollard, Watson
Cross-Exam by Anthony

1866

1 A There is a drawing in the
2 construction plan section 13 (a) and 13 (b) --

3 MR. GENEST: Exhibit 55.

4 A The drawing follows,
5 it is in section 13 (a) behind tab 6 which is entitled
6 "Procedures", and it follows page 32.

7 MR. ANTHONY:

8 Q Could you give us any
9 indication then, I gather that this evidence
10 is basically then for construction purposes, it is the
11 width that is required in order to facilitate the --

12 MR. GENEST: Excuse me,
13 sir. I do not think that Mr. Anthony has let the
14 witness answer the question. The question was
15 why is it 120 feet and he was going to something to
16 illustrate the point and he did not get a chance to
17 finish it.

18 MR. ANTHONY: I am sorry,
19 I did not realize that you were proceeding, carry on.

20 A This particular drawing
21 which is called "Arctic Construction Right-of-Way
22 Configuration" and the right hand side on this sketch
23 is the snow road surface. This is the road that is
24 required for stringing pipe, hauling materials and
25 equipment. It is a road that will be used by
26 standard trucks and things like that. The next
27 section to find is the working lane and this is
28 actually the working area where the pipeline laying
29 equipment operates. There is an area available
30 for setting the pipe on wood skids or blocks, an

1 area for the ditch, an area for the spoil bank, and an
2 area for the stripped tundra to be piled if in fact
3 that is going to be used in any particular area.

4 To give you some idea of
5 the dimensions that are necessary, the road width
6 is approximately 30 feet. The working lane is
7 approximately 35 feet. The area for welding the pipe
8 and putting it on skids is about 11 feet. The ditch
9 is about seven feet wide, the distance from the
10 edge of the spoil bank to the edge of the ditch --
11 you have to leave a little bit of space there of about
12 two feet with the maximum depth ditch which will occur
13 at times with conventional trenching equipment --
14 the width of the spoil pile will be about 25 feet and
15 you need approximately 10 feet to store the stripped
16 tundra and when you add all of those together it comes
17 to 120.

18 Q Thank you and could
19 you tell me whether any land beyond the right-of-way
20 will be required?

21 A Yes, -- yes, it would
22 be required for the temporary access roads for instance,
23 it would be required for permanent access roads to
24 facilities, the road between the compressor stations
25 and the landing strip sites for instance, land will
26 be required for landing strips -- is that the type
27 of information that you want?

28 Q yes, could you give
29 us an indication of size of these for example, what
30 the normal width of the access road and --

1 A I am pretty sure
2 that the width of an access road is not -- we have
3 not defined it -- it would be the absolute minimum
4 that we would require on a temporary basis. On
5 a permanent basis it -- I am not sure if it is defined
6 anywhere. It is whatever is required. It would be
7 something on the order of 50 feet, I would think.

8 Q What about the need
9 at river crossings for stacking and so on?

10 A Yes, there will be
11 stockpile sites required along the rivers -- there will
12 be additional right-of-way required at rivers
13 for working areas -- major river crossings -- for working
14 areas and storing materials and equipment.

15 Q And do you have any
16 indication of what the requirements are for these
17 purposes?

18 A I do not think -- no
19 not for river crossings.

20 THE COMMISSIONER: Mr.
21 Anthony, it is one o'clock. How are we getting
22 on?

23 MR. ANTHONY: I would imagine
24 that I would be another five or ten minutes at the
25 most. I have really only a few more questions to
26 ask with respect to connecting facilities and that is
27 all that I have.

28 THE COMMISSIONER: Well,
29 I think that you can ask those tomorrow morning.
30 Before we adjourn, Mr. Dau, I want to ask you about

1 this cross-Delta route. I appreciate that Mr.
2 Genest will be filing all of the material as soon
3 as possible, but just so I understand where we are
4 at, you told us that by taking the Prudhoe Bay pipeline
5 across the -- across Shallow Bay and the mouth of the
6 Mackenzie Delta, you would save approximately \$100
7 million dollars.

8 A Yes, sir.

9 Q Now, the pipeline
10 guidelines which were tabled in the House of
11 Commons on June 28, 1972 say that the Government of
12 Canada is prepared to receive and review applications
13 to construct one trunk oil pipeline and/or one
14 trunk gas pipeline within the following broad corridors:
15 The first corridor is in the Mackenzie Valley.

16 A Yes.

17 Q The second corridor is
18 defined in this way, across the northern part of the
19 Yukon Territory either adjacent to the Arctic coast
20 or through the northern interior region from the
21 boundary of Alaska to the general vicinity of Fort
22 McPherson and thus to join the Mackenzie corridor.
23 You said those were the only logical corridors --
24 is that still your view?

25 A I have not narrowed it
26 down that far, sir. I was referring to the
27 coastal plain and the interior, not specifically
28 excluding the Delta.

29 Q Well, the coastal route
30 that you had already chosen -- by you, I mean Arctic

1 Gas and its advisors including you -- the coastal
2 route, you had already chosen then actually brought you
3 along the Arctic coast to the general vicinity of
4 Fort McPherson?

5 A That is correct, sir.

6 Q Now, by going across the
7 Delta, you certainly are no longer within the
8 general vicinity of Fort McPherson.

9 A That is correct.

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Dau, Williams, Mollard, Watson
CrossExam by Commissioner

1 THE COMMISSIONER: Mr. Genest
2 and other counsel, you might consider the meaning --
3 and I certainly don't wish you to address me on the
4 subject now -- but you might consider the meaning of
5 the words of the pipeline guidelines in relation to the
6 definition of the corridor, the second corridor, because
7 what concerns me -- let me put it this way, what
8 concerns me is whether the pipeline guidelines laid down
9 by the Minister of Indian Affairs & Northern Development
10 and the Minister of Energy, Mines & Resources in the
11 House of Commons contemplated that any pipeline would
12 not cross the Mackenzie Delta. That is a concern that
13 seems to me arises from an examination of the pipeline
14 guidelines.

15 The other thing that concerns
16 me, Mr. Dau, is that you said that the cross-delta
17 route was in the first instance rejected by Arctic
18 Gas on environmental grounds.

19 A That's my understanding,
20 sir, that it was rejected at that time because everyone
21 had the impression that that particular part of the
22 delta was very sensitive from an environmental point
23 of view. I also understand that as further studies
24 developed, that the particular area at which we're
25 crossing the delta is not that sensitive. It does not
26 have for instance, a lot of the lakes that are in the
27 delta further south.

28 Q Yes, I understand that.
29 But in the first instance when Arctic Gas was consider-
30 ing which route the Prudhoe Bay link ought to take,

Dau, Williams, Mollard, Watson
Cross-Exam by Commissioner

1 it favored the route that is still the prime route along
2 the coast and then dipping south before it reaches the
3 delta and going around the delta to McPherson and then
4 to Travaillant Lake. Now, that route was favored over
5 the cross-delta route, notwithstanding the \$100 million
6 additional cost because of these environmental concerns
7 that had come to the attention of Arctic Gas and its
8 advisors. That is what I gather from what you have
9 told me.

10 A Yes. Don't misunderstand
11 me, sir, at that stage no field investigation had been
12 done, and no one was aware of the \$100 million in
13 saving. In fact at that time, I'm sure that the
14 impression was that there probably would not be a
15 saving. We had not conducted drilling programs in the
16 delta. We had not investigated the channels in detail.
17 You know, the investigations weren't there. They came
18 later, that clearly demonstrated that there was a
19 substantial saving in costs. But we had not done
20 those studies very early, we did not have a cost estimate,
21 in other words.

22 Q Well, Arctic Gas has
23 now concluded that there is a substantial saving in
24 cost of 100 million approximately by taking the route
25 across the delta instead of the route around south
26 of the delta via Fort McPherson. The environmental
27 studies that have been carried out, I take it from
28 what you have said, were carried out by the producers
29 in the delta and not by Arctic Gas.

30 A Both, sir, the consultants

Dau, Williams, Mollard, Watson
Cross-Exam by Commissioner

1 that have been retained by Northern and Arctic Gas have
2 conducted some studies and studies are still continuing.
3 It's my understanding that some of the environmental
4 work performed by the producers is being shared by
5 Arctic Gas. I think the information is available to
6 Arctic Gas.

7 Q Well, let me put it to
8 you this way, because I'm concerned to know how the
9 decision was reached. At some stage it became
10 apparent to Arctic Gas that there was a \$100 million
11 saving that could be achieved and even in the world
12 of Arctic Gas that is not an ⁱⁿsubstantial sum. At
13 any rate, was it -- and if you can't answer this,
14 certainly we can leave it until a later stage -- but
15 was it upon discovering that there was that saving
16 to be made by crossing the delta, was it then that
17 the environmental studies were carried out in
18 collaboration with the producers, or had they already
19 been under way for some considerable time?

20 A I believe that the panel
21 that will be discussing the environmental considerations
22 can give you specific details of that. I'll attempt to
23 get that analogy if I can, for you, and respond. The
24 - it's my impression that there were environmental
25 studies going on before the \$100 million was apparent.

26 Q Yes, well what concerns
27 me was essentially this, whether those studies indicated
28 that the route via Fort McPherson was in fact the
29 route that ought to be taken, balancing the environ-
30 mental considerations, weighing those in the balance?

Dau, Williams, Mollard, Watson
Cross-Exam by Commissioner

1 What concerns me is whether -- and this is what this
2 Inquiry is really about in a sense -- whether the con-
3 sideration of the environmental questions ^{that} resulted in
4 a different conclusion being reached about the suitability
5 of the cross-delta route from an environmental
6 point of view, came after the conclusion had been reached
7 that there would be a substantial saving to be made.
8 I'm really raising that for Mr. Genest and others.

9 MR. GENEST: I appreciate that,
10 sir, but in my respectful submission my suggestion
11 would be that the proper witness to address those
12 matters would be Mr. Horthy, who will be here at the end
13 to give us the chronology. My understanding is from
14 my clients is it was an assumed fact that you couldn't
15 touch the delta because of environmental concerns. The
16 early environmental information started to shape that
17 assumption a little bit, and then it was decided,
18 "Well, we better have a look at it."

19 But I think Mr. Horthy would
20 be the proper witness to deal with the concerns that
21 you have expressed, which of course are of great
22 interest to the Inquiry.

23 THE COMMISSIONER: Well, that's
24 all until -- we'll adjourn until nine o'clock tomorrow
25 morning.

26 (PROCEEDINGS ADJOURNED TO MARCH 13, 1975)
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AUTHOR
Mackenzie Valley pipeline inquiry:

Vol. XVI 12 March 1975

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MACKENZIE VALLEY PIPELINE INQUIRY

IN THE MATTER OF AN APPLICATION BY CANADIAN ARCTIC
GAS PIPELINE LIMITED FOR A RIGHT-OF-WAY THAT MIGHT
BE GRANTED ACROSS CROWN LANDS WITHIN THE YUKON
TERRITORY AND THE NORTHWEST TERRITORIES FOR THE
PURPOSE OF THE PROPOSED MACKENZIE VALLEY PIPELINE

and

IN THE MATTER OF THE SOCIAL, ENVIRONMENTAL AND
ECONOMIC IMPACT REGIONALLY OF THE CONSTRUCTION,
OPERATION AND SUBSEQUENT ABANDONMENT OF THE ABOVE
PROPOSED PIPELINE.

(Before the Honourable Mr. Justice Berger, Commissioner)

Yellowknife, N.W.T.

March 13, 1975.

PROCEEDINGS AT INQUIRY

VOLUME XVII

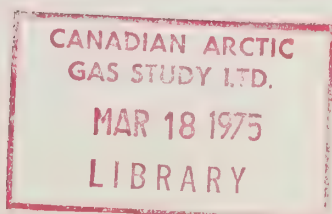
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APPEARANCES:

Mr. Ian G. Scott, Q.C.	
Mr. Stephen T. Goudge,	
Mr. Alick Ryder and	
Mr. Ian Roland	for Mackenzie Valley Pipeline Enquiry;
Mr. Pierre Genest, Q.C.	
Mr. Jack Marshall,	
Mr. Darryl Carter, and	
Mr. John Steeves	for Canadian Arctic Gas Pipeline Limited;
Mr. Reginald Gibbs Q.C.	
Mr. Alan Hollingworth	for Foothills Pipelines Ltd.;
Mr. Russell Anthony,	
Prof. Alastair Lucas &	
Dr. Andrew Thompson	for Canadian Arctic Resources Committee;
Mr. Glen W. Bell and	
Mr. Gerry Sutton	for Northwest Territories Indian Brotherhood and Metis Association of the Northwest Territories;
Mr. John U. Bayly	for Inuit Tapirisat of Canada and the Committee for Original Peoples' Entitlement;
Mr. Ron Veale and	
Mr. Allan Luke	for Yukon Native Brother- hood;
Mr. Carson H. Templeton	for Environment Protection Board;
Mr. David Reesor	for Northwest Territories Association of Municipalities
Mr. Murray Sigler	Northwest Territories Chamber of Commerce



I N D E X

Page

WITNESSES FOR APPLICANT:

Guy Leslie WILLIAMS
John Douglas MOLLARD
David William WATSON
Philip Harvey DAU

- Cross-Examination by Mr. Anthony (cont) 1886
- Cross-Examination by Mr. Bell 1898
- Cross-Examination by Mr. Bayly 1944

EXHIBITS:

- 74 Supplement to Application & Exhibits
relating to alternative 42-inch supply
lateral line size 1877

E R R A T A

Where "bore pits" appear, they should read
"borrow pits".

Yellowknife, N.W.T.

March 13, 1975

(PROCEEDINGS RESUMED PURSUANT TO ADJOURNMENT)

MR. GENEST: By your leave, sir, I have two matters to speak to before we start.

I advised you yesterday that a filing had been made with the Minister that we anticipated to have available here for filing with you when we opened, but was held up by our uncertain transportation systems, and I should like to file that now, sir. I have already given -- as Exhibit 72 -- I have already distributed a copy to my friends, and given a copy to Miss Hutchinson, and it relates to a -- perhaps the briefest way of describing it, sir, so it could be understood is to refer you to page 2 on the first tab of the document, it's headed:

"Supplement to Application and Exhibits
relative to alternative 42-inch supply
laterals line size,"

and if I just may try your patience briefly and read from page 2 of the application, which -- of the supplement, really, which is addressed both to the National Energy Board and to the Minister of Indian Affairs & Northern Development. I quote:

"The alternative hereafter described in detail consists of 42-inch diameter supply lines from the Alaska-Yukon border and from Richards Island to the Travaillant Lake junction, together with the necessary compressor and chilling facilities in place of the

48-inch diameter supply lines, compressor and chilling facilities earlier described. The effect on applicant's estimate of capital cost its pro forma financial statements, its construction and operations plans, and its environmental statement should the alternative design be adopted, are described also in the appropriate sections following. The specific sections submitted here within this volume for filing with the Minister of Indian Affairs and Northern Development, and to the National Energy Board are the listed sections, Sections 8-A, 8-B, 13-A, 13-B, and 14-B .

In addition, the following specific sections are submitted herewith for filing in this volume to the National Energy Board and are furnished to the Minister of Indian Affairs & Northern Development for information, Section 10, cost of facilities, Section 11, pro forma financial statements, All other sections filed in support of the applicant's March 21, 1974 application as later supplemented and amended would remain unchanged and would not be significantly changed by adoption of the alternative design herein described. The material submitted herewith is filed so that it may be examined by the Board, the Department and its Inquiry at this time, so that final evaluation may be made more expeditiously, should the applicant hereafter determine that

Dau

1 it should amend its application to reflect the
2 changes in this volume."

3 Sir, I would like to tender this, reserving, if I might,
4 the position I have taken with respect to Sections 10 and
5 11, that is the cost of facilities and pro forma finan-
6 cial statements. I can do it two ways, which is by
7 reserving; the other way is by physically ripping out
8 of the document the sections in question.

9 So if that might be filed,
10 sir, as the next exhibit.

11 (ALTERNATIVE LINE SIZE MARKED EXHIBIT 74)

12 MR. GENEST: Mr. Dau, sir,
13 has information on the breakdown of costs between
14 Alaska and Canada relating to the interior route which
15 I undertook to try and get overnight, and perhaps he
16 might be permitted to deal with that before the cross-
17 examination proceeds? Mr. Dau.

18 MR. DAU: The coastal route, the
19 prime route has 195 miles in Alaska, and 297 miles in
20 Canada for a total of 492 miles to Travaillant Lake
21 junction.

22 The interior route by the
23 Marsh Fork alternative, has 297 miles in Alaska and
24 240 miles in Canada, for a total of 537 miles to
25 Travaillant Lake junction.

26 With the interior route there
27 is an additional 102 miles in Alaska and 57 miles less
28 in Canada which results in a total of 45 additional
29 miles on the interior route.

30 With respect to costs, the

Dau

1 Alaskan portion costs approximately \$550 million more
2 on the interior route; in Canada because of the
3 reduced length. The cost is \$25 million less for a
4 total increase in cost on the interior route of \$525
5 million.

6 MR. GENEST: Let me see if
7 I understand this. I thought I did. There is a
8 reduction in cost in Canada, is that what you were
9 saying?

10 MR. DAU: That is correct.

11 MR. GENEST: And the increase
12 is taking place in Alaska.

1 MR. DAU: Yes.

2 MR. GENEST: That is all
3 that I have, sir.

4 MR. SCOTT: Mr. Gibbs
5 has a matter.

6 MR. GIBBS: Sir, this arises
7 out of the filing of exhibit 72 this morning, and
8 the changes that it seems to make in the applicant's
9 material and the number of additional alternatives
10 it raises and the difficulty of getting to grips
11 with what precisely the applicant wants. It is sort
12 of like trying to hang on to a hand full of smoke.
13 Mr. Dau told us yesterday that they have spent six
14 years studying this routing and the design and the
15 construction. In the last ten days we have had three
16 substantial changes, all called "alternatives",
17 whatever "alternatives" means, and in my submission it
18 is time to ask about these alternatives and require
19 the applicant to say what it is he is making applica-
20 tion for.

21 For example, sir, in this
22 volume, the changes introduced by way of a possible
23 amendment at some later unspecified date, affect, ac-
24 cording to the applicant's own document, facilities
25 location, facilities design and capacity, construction
26 plan, operations and maintenance plan, environmental
27 statement, cost of facilities, pro forma financial
28 statements. Now, there is not much left that is not
29 possibly going to be amended.

30 But we are not told that this

1 -- there is anything firm in this respect. The last
2 paragraph on page three of the first tab of this
3 document says, "The materials submitted herewith is
4 filed so that it may be examined by the Board, the
5 Department and its Inquiry at this time, so that final
6 evaluation may be made more expeditiously should
7 the applicant hereafter determine that it should
8 amend its application."

9 Now, sir, to introduce a
10 42" line now requires that for everyone of the
11 forthcoming panels on engineering, some additional
12 and ⁱⁿ some cases a large additional amount of work
13 must be done. For example, the next panel, the
14 geotechnical. As I understand it that panel deals,
15 amongst other things, with bouyancy. Now, I am
16 making this only as an example, sir and I am not
17 suggesting that that is all -- as I understand it
18 from exhibit 72, having briefly gone through it, it
19 proposes a 42" line which obviously is a lesser
20 circumference than 48 and it proposes a smaller wall
21 thickness. My country logic tells me that that means
22 that it weighs less and if you at the same time have
23 the same internal pressure, it seems to me that that
24 makes a different bouyancy consideration. That is
25 just one of the things that will be changed by using
26 this 42" alternative.

27 Similarly sir, the con-
28 struction timing is changed. In the tab under
29 "construction timing" they make some opening
30 statements, the applicant, and then says, "This

1 sub-section outlines the amendments which would be
2 necessary to applicant's construction plan as
3 described in its March 21, 1974, filing, amended as
4 noted above. If the design for the 42" supply
5 line is adopted." So we appear then to be faced,
6 sir, with two different construction timing plans.
7 Also entering into this, Mr. Commissioner, is
8 design, in particular the metallurgy. In preparation
9 for that design panel we look at the specs for the pipe,
10 the
11 /wall thickness, how it might behave under certain
12 conditions for a 42" . 7 something wall thickness --
13 I am sorry, 48".

14 But there may be different
15 considerations applying to 42" with a decimal
16 six what ever it is wall thickness. That requires
17 if the applicant is serious about it, that we go
18 into this highly technical field to investigate the
19 availability of it, the ability of the manufacturer
20 to make it, safety factors applying to it.

21 Now, it is easy sir, to
22 turn up this document and say here are the
23 changes that we propose to make, but those changes
24 are profound and they require a lot of work if they
25 are going to seriously be treated. This is not
26 the case 'if we are dealing only with a 48" line
27 because all of that preparatory work has been done
28 and my representation to you, sir is this that it
29 is about time the applicant said what he wanted
30 so that the interested parties, sir, and I presume
the general public and yourself, know what we are

1 dealing with. Right now, day by day, we seem to
2 get some amendment which triggers off a reaction that
3 affects all the other parts of the application and
4 that is my submission to you, sir, that the
5 applicant be required to say what it is, for which
6 application is being made, and not keep turning up
7 these alternatives to the point where we end up
8 with a plate of spaghetti and he is saying I will
9 go wherever you will tell me to go. I think he has
10 to sometime say what he wants.

11 Thank you sir.

1 MR. GENEST: Are you required
2 to make a response to that, sir?

3 THE COMMISSIONER: I leave that
4 up to you.

5 MR. ANTHONY: I was going to
6 myself, just ask my friend one question, which perhaps
7 logically follows on what Mr. Gibbs has said, and that
8 is whether my friend intends to recall this panel when
9 he decides whether they are going to go ahead with the
10 cross-delta route, and where it's going to be and so
11 on.

12 MR. GENEST: Perhaps if any
13 other party has comments to make I could reserve mine.

14 MR. SCOTT: It isn't clear
15 precisely the relief that Mr. Gibbs is asking for
16 except that it appears to be a declaration made by
17 Mr. Genest rather than by the Commission. I would
18 have thought that there was something to be said for
19 Mr. Gibbs' position, not only in relation to the
20 dimensions of the pipe, but also to the variety of
21 alternative routes that are stipulated so far in the
22 evidence, and without anticipating what may happen
23 in the future, I am sure Mr. Genest is conscious that
24 if the applicant is unable to tell us with reasonable
25 precision what he proposes to do, it may be strongly
26 urged before the Inquiry at a later stage that it is
27 not possible at this time to assess the environmental
28 and socio-economic impact of the pipeline. It seems
29 to me that that's a very substantial risk, and I would
30 hope that before running it, Mr. Genest would want to

1 carefully consider whether he can't, in consultation
2 with his clients, narrow down the variety of alternatives
3 and possibilities that he offers as his pipeline plan.

4 MR. GIBBS: I'm sorry if I
5 didn't make myself clear on what I really requested.

6 I want to know from the applicant what he's after
7 from this Commission -- what route, what design, what
8 his pipeline is going to be, and I guess I'm asking
9 you, sir, for a direction on whether we are seriously
10 now to look at the 42-inch as well as the 48?

11 MR. GENEST: Mr. Commissioner,
12 I am a little surprised by Mr. Gibbs' reaction to a
13 42-inch pipe. He has been parading up and down the
14 country with a 42-inch pipe with maple leaves all over
15 it, and I would think that he is an authority on 42-inch
16 pipe who would not need much preparation about it.

17 I appreciate the problem raised
18 by Mr. Scott, and what we are after at this stage in
19 the Inquiry, sir, is the right-of-way for which we have
20 applied in our application to the Minister, as amended
21 in connection with the Fort Simpson route change. That
22 is what we are after.

23 This project is one of large
24 economic significance to its supporters or its propon-
25 ents. Engineering studies, there are large engineering
26 studies going on. One of the alternatives being con-
27 sidered and largely affected by economic and gas supply
28 matters, is the question of re-sizing the Alaska -- the
29 supply legs of the line down to a 42" pipe rather
30 than a 48-inch pipe. We thought it was our duty, if we

1 are considering this as an alternative, that ought
2 to be placed before your Inquiry. It is relevant.

3 I cannot say and we are not
4 in a position at this time to say that we are going
5 to adopt this alternative. I would anticipate that
6 later on in this Inquiry, decisions will have to be
7 made on this, as they will on the cross-delta alterna-
8 tive that we are asking you to look at. But surely
9 it is clear that until we amend our application, what
10 we are after is the right-of-way that we have
11 described in our application to the Minister and which
12 has been referred to you. We have asked the Minister and
13 we ask you to examine these alternatives, so that if we
14 do file an amendment because of economic or other
15 considerations, we won't have to have a new hearing.
16 That's the only position I can take at this stage.

17 Now I appreciate the problem
18 as to examination. That's another problem, as to
19 whether these matters can be examined when filings
20 come in late like it has. I am, of course, flexible.
21 If the parties demonstrate to you, sir, that they are
22 prejudiced and that the panel should come back, on
23 these alternatives, then of course they'll come back.

24 MR. SCOTT: Mr. Commissioner,
25 if I could say just one thing, whether or not that
26 view of the matter is acceptable to you, I think Mr.
27 Genest should be clearly on notice that insofar as
28 he has put forth lately three or four substantial
29 alternatives, including a route change in the Mackenzie
30 Delta for which we don't yet have any accurate drawing,

Dau, Williams, Mollard, Watson
Cross-Exam by Anthony

1 he will not, I am certain, in public assert that any
2 delays that are occasioned by that in this Inquiry are
3 other than the responsibility of his clients, who have
4 been unable to make the appropriate decisions as yet.
5 I just want to make it perfectly clear that if there
6 are delays occasioned by this, as there undoubtedly
7 may be, that the responsibility is clearly that of the
8 applicant and nobody else.

9 MR. GENEST: I accept that,
10 sir.

11 MR. ANTHONY: Mr. Commissioner,
12 I wonder if I may continue with the few questions to
13 the panel in continuation of yesterday's discussion?
14

15 CROSS-EXAMINATION BY MR. ANTHONY (CONTINUED):

16 Q Mr. Dau, if I may direct
17 the first to you. Yesterday we described in some
18 detail other locations and we went through Exhibit 60,
19 Section 14-E-1-10, which described the Fairbanks
20 corridor and so on, and the question that I had in
21 mind upon reading the transcript didn't necessarily
22 come clear, though I'm sure it was understood, was
23 that my understanding, and I expect you to agree, if
24 required it is technically feasible and it's your
25 opinion that it's technically feasible to build a
26 gas pipeline along any one of those corridor routes.

27 WITNESS DAU: Yes.

28 Q And do you recognize
29 the existence of the utility corridor around the
30 Arctic Wildlife Refuge in establishing the interior

Dau, Williams, Mollard, Watson
Cross-Exam by Anthony

1 route and I would assume similarly the more southerly
2 if
3 U.S. corridor, /such should be approved, necessitating
4 a more southerly Canadian route would similarly be
5 technically feasible.

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A Yes.

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2 Q Now, I wonder if I may
3 also clear up another fuzzy area and I direct my ques-
4 tions in this regard to Mr. Williams. You recall
5 yesterday we mentioned in passing the question of
6 government directions, formal or informal or
7 any indication from the government on the question of
8 route selection and you recalled a meeting that
9 you had with Government personnel and I wondering
10 now that you have had an opportunity to reflect
11 overnight on that, whether your memory is any sharper
12 and we could get perhaps a little more information
13 about that meeting.

14 I was wondering if you could
15 tell me if you recall where that meeting was held?

16 WITNESS WILLIAMS:

17 A In Ottawa. You mean
18 the specific building?

19 Q No, -- Do you recall
20 when that meeting was held?

21 A My recollection was
22 in the spring of 1972.

23 Q And do you recall
24 who -- whether Mr. Horthy was in attendance at that
25 meeting?

26 A No, I am fairly certain
27 that he was not.

28 Q Was Mr. Hurd at that
29 meeting?

30 A Mr. Hurd?

Dau, Williams,
Mollard, Watson
Cross-Exam by Anthony

1889

1 Q Yes.

2 A I think so.

3 Q Was Mr. Digby Hunt of
4 the Department of -- DIAND attended at that meeting?

5 A There were -- my recollec-
6 tion is that ~~there~~ were two meetings within a period
7 of about a month and I attended one of them only.
8 I do not recall Mr. Hunt being at the one that I was
9 at. I think that maybe he was at the prior one that
10 I did not attend, but I am not certain of that.

11 Q Was Mr. Alex REid of
12 the Department at that meeting?

13 A Yes, sir, he was there.

14 Q Do you recall who called
15 the meeting?

16 A No, I do not. I think
17 I was asked by Mr. Hurd or someone else from the
18 Northwest Project to attend.

19 Q And do you know if there
20 were any meetings kept by NORthern Engineering
21 Services or Arctic Gas of that meeting?

22 MR. GENEST: The minutes,
23 do you mean?

24 MR. ANTHONY: The minutes of
25 the meeting, yes.

26 A No, I recall reading
27 the minutes of the -- I think that someone from
28 the Government produced for the first meeting. I
29 do not recall any minutes of the second meeting at
30 which I attended.

1 Q Well, let's deal for
2 a moment with the second meeting that you attended.
3 Do you recall what was said at that meeting by
4 either yourself or any members of Arctic Gas or
5 the Government about the topic of pipeline route
6 selection?

7 A As I mentioned yester-
8 day, I do recall some discussion of the routing in
9 the Fort Simpson area, the crossings of the Mackenzie
10 and Liard Rivers. There were members of -- I am
11 fairly certain that there were members of the
12 Department of Public Works at that meeting and I
13 think that there was some discussion with respect
14 to the proposed Mackenzie Highway location --

15 Q You mentioned that
16 there was discussion of the Liard crossing and around
17 Fort Simpson, would you describe the nature of
18 that discussion.

19 A Yes, as I also men-
20 tioned yesterday that this meeting was just
21 prior to the merger of the gas Arctic system group
22 and the northwest project group and at that time,
23 or at least immediately prior to that time, the
24 northwest project were still considering, mainly
25 considering a route on the west side of the
26 Mackenzie River.

27 The gas Arctic system
28 was concentrating on a route on the east side of
29 the Mackenzie River. I think that some discussions
30 had gone on between gas Arctic system and the

1 northwest project and the announcement by Mr.
2 Trudeau that the highway was going to proceed --
3 had, I think, came prior to that meeting and in our
4 preliminary discussions, this was about the time that
5 the two pipeline groups decided to change their
6 prime location at least -- I should not say change
7 it -- the northwest group decided to change their
8 location to the east side of the river and the question
9 arose, I think the question was asked by someone from
10 the Government, why we chose the crossing of the
11 Mackenzie at Burnt Island and also the Liard crossing
12 instead of going east of Simpson. The explanation
13 at that time was that the route crossing the
14 Mackenzie at Burnt Island and the Liard River
15 was shorter and in our consideration, it was more
16 economic. This though was prior to the time that
17 the consideration of dual or twin crossings was
18 considered.

19 Q You mentioned also at
20 this meeting that you attended, there was discussion
21 about the question of the highway location and
22 I suppose as it relates to the pipeline location
23 -- would you tell us the nature of those discussions,
24 please.

25 A No, sir, my memory is
26 blank on it. Do you have minutes of that meeting that
27 maybe I could refresh my memory?

28 Q Well, I was hoping that
29 you would have minutes of that meeting. It is your
30 meeting.

1 A If we have them they
2 are certainly not with me in Yellowknife. I do
3 not even think we have any in Calgary, but I am not
4 certain of that.

5 Q Well, perhaps I could
6 ask my friend if he would assist you in informing
7 yourself of that meeting, obtaining, if there are,
8 copies of the minutes and generally allowing you to
9 arm yourself with the information that took place
10 and perhaps we could continue this at some subsequent
11 time.

12 MR. GENEST: Mr. Commissioner,
13 I will do that if directed to do so by you. My
14 submission is that the relevance of this
15 whole line of discussion is very tenuous and if we are
16 going to get in to step by step every time we pick
17 up the phone and talk to somebody in Ottawa, we could
18 devote two years to that subject alone.
19 So I am in your hands, sir.

20 MR. ANTHONY: If I could make
21 a comment then, I, of course do not intend to go on a
22 phone call by phone call analysis of what took place
23 between the Government and the Arctic Gas consortium
24 with respect to the pipeline. However, if in fact
25 there were meetings held where the question of the
26 location of the pipeline route was discussed and if
27 there were any directions from the Government to
28 Arctic Gas as to where the pipeline route should go
29 or if there were any recommendations from Arctic
30 Gas to the Government as to where it s guidelines

1 should say it should go, I think that that is
2 probably very important and that information, if it
3 is available should be before us.
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Dau, Williams, Mollard, Watson
Cross-Exam by Anthony

1 MR. GENEST: I have one
2 additional comment, sir. The order-in-council con-
3 stituting this Inquiry makes specific reference to the
4 expanded guidelines for northern pipelines. If you're
5 going to go behind those guidelines to see how they
6 were formulated, I suppose one might consider it
7 relevant to go behind the order-in-council and see
8 what discussions were held as to who was going to
9 be appointed to head it, and --

10 THE COMMISSIONER: And then
11 behind the Territorial Lands Act.

12 MR. GENEST: That's right.

13 MR. ANTHONY: My submission
14 was not to go behind the guidelines, my submission is
15 that we go behind the route selection and that's what
16 I'm attempting to determine, how the route selection
17 was made, not how the guidelines were made.

18 THE COMMISSIONER: Well, you
19 didn't put it that plainly, Mr. Anthony. I agree with
20 Mr. Genest that the order-in-council and the guidelines
21 constitute the foundation of this Inquiry, and the
22 Inquiry is bound by those documents. Those documents
23 which bear the implementer, the Governor-General-in-
24 Council are the mandate of this Inquiry. Insofar as
25 the question of the choice of the route of the pipeline
26 came under consideration, if it did, at the meeting,
27 it seems to me that it can be pursued but so far nothing
28 has come out that would indicate that it was discussed
29 at that meeting.

30 What we're concerned with here

Dau, Williams, Mollard, Watson
Cross-Exam by Anthony

1 is the merits of the route based on social, economic
2 and environmental considerations. I appreciate that
3 if it is your purpose to show, if you can, that the route
4 was chosen by Arctic Gas on the basis of extraneous
5 considerations, that that is something this Inquiry
6 should take into account; but I really am concerned
7 that this is getting us somewhere and not just holding
8 us up.

9 MR. ANTHONY: Mr. Commissioner,
10 I certainly wish this information before us because I
11 think it does get us somewhere, and it goes towards
12 exactly the issue you mentioned of determining the
13 criteria applied in this question of route selection,
14 and we have evidence by Mr. Williams of two meetings
15 between the consortium or their predecessors and the
16 government, at which time questions of route selection
17 or route location were discussed, and I think that it
18 would be helpful to us for the purpose of determining
19 what criteria were in force or put forward, to determine
20 the -- at least that element of those meetings.

21 I don't want to go into a day by day description of
22 the meetings and so on that took place, but I think at
23 least in that limited sense the information is relevant
24 and important to this Inquiry.

25 THE COMMISSIONER: Well, I'll
26 take the matter under consideration and I'll rule upon
27 that tomorrow morning.

28 MR. ANTHONY: Q Mr. Dau, if I
29 may turn to you again then, we ended our discussion
30 yesterday on a discussion of the right-of-way and I

Dau, Williams, Mollard, Watson
Cross-Exam by Anthony

1 believe that at that time we had agreed and recognized
2 that the 120-foot right-of-way is to be exceeded where
3 required for access roads and for stacking at river
4 crossings. I think that's about the place we were at.

5 A Not for access roads.

6 Q Sorry, are the access
7 roads then within the 120-foot right-of-way?

8 A They can be. In an
9 instance of a stockpile site at the river, which is
10 say four or five miles from the right-of-way, I would
11 define the road from the stockpile site to the right-
12 of-way as an access road. That is not contained on the
13 pipeline right-of-way.

14 Q So that if we see in the
15 alignment sheets a stockpile site or a wharf or any-
16 thing of this nature, that is off or more than 120
17 feet off the right-of-way, we can assume that there
18 will be an access road from that stockpile site to
19 the right-of-way?

20 A The location is shown
21 on the material that has been filed in the application
22 of those roads.

23 Q And am I right in saying
24 that the -- at river crossings that it is necessary to
25 have what is called a dog leg in order for you to
26 swing the pipe across the river, is that accurate?

27 A No sir.

28 Q Could you tell me then
29 at major river crossings, how far beyond the 120-foot
30 right-of-way you expect to require land?

Dau, Williams, Mollard, Watson
Cross-Exam by Anthony

1 A I don't think that has
2 been determined. It would seem to me that what they're
3 requiring is working space, working area to facilitate
4 the assembly of the pipeline to be pulled into the
5 river, and that 120 feet in those areas may require
6 widening to two or 300 feet, each one is specific,
7 we have to look at each individual site to determine
8 that. We have not done that as yet.

9 Q My understanding is that
10 in river crossings in southern lines, that often this
11 is -- you need up to 800 feet on either side to do this
12 sort of thing, is that accurate?

13 A That would be unusual, in
14 my view, if you required a right-of-way 800 feet wide
15 to install one river crossing. I'm not saying it hasn't
16 occurred, it probably has.

17 Q Well, I wonder if you
18 could help me then. I find it rather difficult in
19 assessing the appropriateness or even the impact of the
20 route that you have selected at for example, a river
21 crossing, without knowing how much land on either side
22 of the crossing you will require.

23 A Could you tell me when this
24 determination is made so that we can determine whether
25 or not the river crossing is in fact appropriate, or
26 even assess the impact?

27 A It would be done at the
28 time of the detailed field survey that located the
29 crossing, and at the time the precise construction
30 procedure to be used in installing the crossing.

Dau, Williams, Mollard, Watson
Cross-Exam by Anthony
Cross-Exam by Bell

1 Q Would that be determined
2 prior to the actual commencement of construction or
3 after?

4 A Prior to.

5 Q Just one further question.
6 If in fact looping is required, if looping is required
7 in the main trunkline, does that require an extension
8 of the right-of-way width?

9 A Yes.

10 Q And if it was to be
11 looped with a 48-inch pipe, how wide would the right-
12 of-way then be required?

13 A You'd probably need
14 another 20 feet or something on that order. We have
15 not looked at that in detail at all.

16 Q Would that be 20 feet
17 on either side, or --

18 A One side.

19 MR. ANTHONY: I have no
20 further questions at this time.

21 MR. BELL: Mr. Commissioner,
22 I gather that it's my turn?

23
24 CROSS-EXAMINATION BY MR. BELL:

25 Q Mr. Dau, you are the
26 president and chief executive officer of Northern
27 Engineering Services?

28 A Yes.

29 Q When was Northern
30 Engineering Services incorporated?

Dau, Williams, Mollard, Watson
Cross-Exam by Bell

1 A I believe it's November,
2 '72.

3 Q Sometime in '72?

4 A Yes.

5 Q And you've been the
6 president and chief executive officer since the
7 incorporation of Northern Engineering Services?

8 A Yes.

9 Q I believe you said in
10 testimony the other day that Northern Engineering
11 Services has a staff of about 150.

12 A Yes.

13 Q Of whom about 80 are
14 what you call professionals.

15 A Yes.

16 Q Can you just run down
17 briefly the areas of expertise covered by these
18 professionals?

19 A Yes. In the engineering
20 field and geotechnical areas, river hydrology, mechan-
21 ical design, metallurgy, electrical and system control
22 fields, in communications, and in the environmental
23 area, in biologists, in primarily vegetation area,
24 botanists, and the other environmental areas we retain
25 consultants rather than having in house staff.

26

27

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Dau, Williams,
Mollard, Watson
Cross-Exam by Bell

1 Q Would you say that
2 150 is a pretty fair sized company for this type
3 of business in Canada?

4 A It is at this stage
5 of this pipeline application, it is a reasonable
6 size, yes.

7 Q Are there any bigger ones?

8 A Larger engineering or-
9 ganizations?

10 Q Yes.

11 A Yes.

12 Q What would the largest
13 be, what sort of staff would it have?

14 A I am guessing, but it
15 would be in excess of a thousand, I would think.

16 Q I would like to, at this
17 point draw your attention to certain references in
18 the transcript and the application. Could you arm
19 yourself with a copy of the transcript for March 11,
20 1975 -- that is volume 15.

21 A Yes, sir --

22 Q I just have a few
23 references in this particular volume that I would
24 like to point out to you at this time. Could
25 you turn to page 1666 at line ten. There is a sentence
26 that begins "The final route selection..." Could
27 you read that sentence for me, please.

28 Q "The final route
29 selection shown on the alignment sheet involved consider-
30 ation of the technical and economic feasibility of the

1 various alternatives together with environmental and
2 sociological considerations."

3 Q Could you turn then to
4 page 1706 in the same volume --

5 THE COMMISSIONER: What was
6 that last page?

7 MR. BELL: The one that Mr.
8 Dau just read? It was 1666 at line 10, the sentence
9 that begins "The final route selection...", and
10 ends "...together with environmental and sociological
11 considerations."

12 A What was the second
13 reference, sir, what page?

14 Q Page 1706.

15 A Yes.

16 Q At line 28 -- perhaps
17 I will read this one. It says, "In April 1973 a
18 week long seminar was conducted at which a mile
19 by mile examination as then proposed was made by all
20 parties concerned." We are now over on page 1707.
21 "The environmental and socio-economic groups, suggested
22 route modifications and commented on sensitive
23 areas where special precautions would be required."
24 And on page 1707 down on line 21, there is a sentence
25 that reads, "Major modifications together with the
26 manner in which environmental and socio-economic
27 factors received consideration are set forth in section
28 8 (a) 1, on pages..." The transcript says 427 -- I
29 believe that it should be 4 to 7, should it not and
30 section 14 (d) chapters 1 and 6 and 14 (e).

1 Now, I would like to draw
2 your attention to just a couple of more references.
3 These are in the application. That is exhibit no.
4 54 entitled "Location, Design and Capacity of Facilities",
5 Section 8 and "Connecting Pipeline Facilities", Section
6 9. The tab that I am referring to here is tab
7 8 (a) 1 and I would like to draw your attention to
8 a reference on the first page of this tab. It is in
9 the last complete paragraph on page one --

10 MR. GENEST: Sorry, Mr. Bell,
11 could you give me that again.

12 MR. BELL: Yes, it is 8(a) i
13 page 1. and it is the last complete paragraph on
14 that page and I would like to read one of the -- a
15 passage from this, starting at the second sentence
16 which reads: "The route selection process included
17 frequent informal communication, both orally and in
18 writing, between engineers, environmental consultants,
19 socio-economic consultants and the staff of the
20 applicant." And under the same tab, over on page 5,
21 That is 8(a) 1, page 5, the paragraph immediately
22 above the bold face print that reads "Environmental
23 Pipeline Route Factors." the paragraph immediately
24 preceding that and I will read it out. It says,
25 "The applicant has also received and been guided by
26 substantial numbers of suggestions by its socio-
27 economic consultants and other northerners, relative
28 to the location of such facilities as wharves and
29 construction staging areas, air strips and housing,
30 in order to maximize benefits to the residents of the

1 various nearby areas in such ways as well as
2 through employment."

3 Mr. Dau, do you have on the
4 staff of Northern engineering Services any professionals
5 in social or economic matters?

6 A No, sir.

7 Q Do you ever hire outside
8 consultants in these fields?

9 A We did not.

10 Q Well, I would be in-
11 terested to know then how you got your socio-economic
12 advice on the route selection.

13 A Those consultants were
14 hired directly by our client, the applicant.

15 Q I see, and they made
16 available to you their reports and their advice
17 generally.

18 A Yes.

19 Q Are you relying on any
20 of those reports here today?

21 A One moment, please --
22 no.

23 Q You received socio-
24 economic advice, but you are not relying on it?

25 A It was an input into
26 our work. We do not have a formal report to point
27 to.

28 Q Mm-hmm-- you have
29 all kinds of formal engineering reports, though?

30 A Yes.

1 Q But no formal socio-
2 economic reports?

3 A I do not have them,
4 no, sir.

5 Q Let me take you back
6 a couple of days, Mr. Dau to the cross-examination
7 by Mr. Gibbs. I believe he tried to get you
8 to say that Northern Engineering Services is somehow
9 influenced or controlled by Americans and American
10 interests and you resisted that. Is that correct?

11 A Yes.

12 Q Yes. In fact Northern
13 Engineering Services works exclusively for Canadian
14 Arctic Gas, is that correct?

15 A That is correct.

16 Q Since its incorporation
17 in 1972, Canadian Arctic Gas has been Northern Engin-
18 eering Services only client?

19 A No, we have done a very
20 minor amount of work for other clients.

21 Q I see, I see. Approxi-
22 mately what ratio of work would this represent in dollar
23 terms?

24 A Approx -- very small,
25 I would say less than one per cent. But we had other
26 clients and we did other work.

27 Q It is miniscule.

28 A Yes.

29 Q At the present time does
30 Northern Engineering Services seek the business of

1 clients other than Canadian Arctic Gas?

2 A No.

3 Q I would like to refer you
4 again to the transcript, Mr. Dau, the same one, volume
5 15 at page 1650. At line 21. Perhaps I could just
6 read it out. In answer to the question by Mr.
7 Genest: "And what was the assignment given to Northern
8 Engineering?", you replied, "Our assignment is to
9 provide the engineering, environmental and other
10 related technical services necessary to determine the
11 feasibility of an appropriate and efficient method
12 of constructing a pipeline system to transport
13 natural gas from Northern Alaska and Northwest Canada
14 to points as far south as the border between Canada
15 and the lower 48 states of the United States of
16 America."

17 And over to the page on
18 1651: "...and to prepare and cause to be prepared
19 applications for necessary Governmental authorities
20 to construct and operate the pipeline described in
21 the application, to prepare and furnish for financing
22 purposes all necessary and allied information, to
23 to furnish plans, recommendations and reports as
24 may be required." I assume that is as may be required
25 by Arctic Gas. Is that correct?

26 A Yes.

27 Q "...to prepare and
28 present through qualified experts testimony at regu-
29 latory proceedings" which is what you are doing now.
30 I assume that you will be appearing also before the

1 Federal Power Commission and the National Energy
2 Board?

3 A Yes.

4 Q And if the Department of
5 the Interior holds hearings, you will be there too
6 probably?

7 A Yes.

8 Q And if I could just
9 carry on, the last clause is, "... and to perform
10 other engineering and related services as requested
11 by Canadian Arctic Gas study limited."

12 I gather that this is
13 an excerpt of the contract between Northern Engineering
14 Services and Canadian Arctic Gas?

15 A That is correct.

16 Q As President and chief
17 executive officer of the company would you have
18 signed that contract?

19 A I have signed it, yes.

20 Q You have. So you
21 have read it too, I suppose?

22 A Carefully.

23 Q I would like to draw
24 your attention to two of the clauses in this
25 contract. On page 1651, I just point out that line
26 5, the clause that reads, "To furnish plans, recommen-
27 dations and reports as may be required" and by
28 Canadian Arctic Gas, is the implication there and at
29 Section 8: "To perform other engineering and related
30 services as requested by Canadian Arctic Gas Study

1 Limited."

2 Now, it appears that within
3 the list of functions specified here that Northern
4 Engineering Services has to do pretty much what
5 Canadian Arctic Gas asks it to do, for a fee of course.

6 A Yes.
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Dau, Williams, Mollard, Watson
Cross-Exam by Bell

1 Q Has Northern Engineering
2 Services ever refused an assignment from Canadian
3 Arctic Gas?

4 A No.

5 Q Well, Northern Engineering
6 Services for all practical purposes is really an arm
7 of Canadian Arctic Gas, isn't it?

8 A I don't think so, no.

9 Q Well, you have Northern
10 Engineering Services works exclusively for Canadian
11 Arctic Gas, and has done so virtually since its
12 incorporation. It does not seek the business of
13 any other client. It cannot legally refuse an
14 assignment given to it by Canadian Arctic Gas. I invite
15 you to agree with me, Mr. Dau, that when we hear the
16 name, Northern Engineering Services, we're really looking
17 at an agency of Canadian Arctic Gas, and when we see
18 an employee of Northern Engineering Services, we're
19 looking at an employee for practical purposes of
20 Canadian Arctic Gas.

21 MR. GENEST: Mr. Commissioner,
22 I submit that that's argumentative. My friend can
23 cross-examine as to the facts but the conclusions are
24 up to you.

25 THE COMMISSIONER: That seems
26 to me to be a point well taken, Mr. Bell.

27 MR. BELL: I'll abandon that
28 line of cross-examination, Mr. Commissioner.

29 Q Perhaps we can talk
30 about route selection for a while. I'd like to direct

Dau, Williams, Mollard, Watson
Cross-Exam by Bell

1 your attention again to the transcript, Mr. Dau, at
2 page 1706. We've already looked at a portion of this
3 passage, line 25, this is in response to Mr. Genest's
4 question of line 17 where he asks you to describe how
5 environmental and socio-economic consultants retained
6 by the Arctic Gas Group and the Environmental Protection
7 Board participated or contributed to the process of
8 route selection, and you've already mentioned the April
9 1973 seminar at which some of these people were
10 present.

11 I'd be interested to know
12 whether you attended that seminar, sir.

13 A Yes, I attended part of
14 it. There were, as I recall there were a series of
15 meetings going on in different areas, and I attended,
16 not full-time attendance, I attended both sessions at
17 one time or another.

18 Q And for those parts of
19 the seminar which you did not attend, how did you
20 find out what happened at them?

21 A There was a wrap-up
22 section of -- session at the conclusion in which
23 all that attended, the various meetings was summarized
24 in a final meeting, and we had Northern staff members
25 attending at all times, someone from Northern was
26 there at all times.

27 Q I see, was there any
28 kind of report or memorandum that came out of this
29 seminar?

30 A Perhaps Mr. Williams

Dau, Williams, Mollard, Watson
Cross-Exam by Bell

1 could respond to that. I'm not too sure.

2 WITNESS WILLIAMS: My recollec-
3 tion is that there was a transcript of the sessions and
4 that they were summarized in various forms by various
5 people, yes.

6 Q Who was at these
7 seminars? Do you recall, either Mr. Dau or Mr.
8 Williams?

9 A From Northern Engineering?

10 Q Well, amongst the entire
11 crowd, who was there? Do you recall anybody?

12 A Do you want specific
13 names or organizations?

14 Q Well, either.

15 A Certainly the Environmen-
16 tal Protection Board was represented by four or five
17 people at least. There was staff of Canadian Arctic
18 Gas, staff of Northern Engineering. The sessions were
19 in an auditorium and members of the consortium sponsor-
20 ing Arctic Gas were present as observers.

21 Q Any socio-economic
22 people?

23 A Yes sir. Actually
24 Gemini North were represented at that meeting.-- at
25 those meetings. The Environmental Protection Board
26 was represented by Mr. Gordeau.

27 Q Can you tell us, sir,
28 did you attend any of the socio-economic sessions?
29 I assume there must have been a couple anyway.

30 A Yes.

Dau, Williams, Mollard, Watson
Cross-Exam by Bell

1 Q Can you enlighten us as
2 to what sort of input the socio-economic advisors had
3 at that time, what did they say?

4 A I recall one of their
5 major considerations were the traditional hunting
6 grounds, hunting and trapping grounds, particularly
7 in the leg of the route between Fort McPherson --
8 between Arctic Red River and Travaillant Lake junction.
9 I think there was a discussion of the settlement,
10 particularly the settlement of Fort Good Hope and
11 there was some mention of the proposal to extend the
12 runway at Fort Norman, and there was some discussion
13 with the problems or the situation with respect to
14 the residents of Wrigley and the Department of Public
15 Works highway ^{that} /was in engineering stages at that time.

16 Q M-hm.

17 A Those are the things that
18 come readily to mind.

19 Q The sort of things that
20 we might expect. What role did this seminar play in
21 the process of route selection, can you enlighten us
22 on that?

23 A The main outcome of the
24 meeting was that major re-location in the Travaillant
25 Lake area, and several of these other changes that
26 are listed in the appendix of 8-A-1 section that
27 you've referred to, and also the additional ones
28 referred to by Mr. Dau in his testimony, and Mr.
29 Watson in part of his work. Some of ~~these~~ resulted from
30 the meeting and some were for geotechnical reasons

Dau, Williams, Mollard, Watson
Cross-Exam by Bell

1 that maybe didn't stem from that meeting.

2 Q Were any of the changes
3 made as a result of this meeting, made on socio-economic
4 grounds?

5 A No, I can't recall any
6 specific change because of socio-economic concerns.

7 Q So at any other time
8 were socio-economic grounds reasons for route
9 change?

10 A No, we had these
11 discussions with respect to some of the villages in the
12 Valley and I don't recall ever receiving any firm
13 complaints. Things like I've mentioned, extending the
14 runway at Fort Norman and the wharf and stockpile
15 site near Fort Good Hope, I think in our engineering
16 thinking, we maybe thought that this was of benefit
17 to the communities. I don't recall hearing anything
18 that strongly opposed that view.

19 Q So what you're saying is
20 there were no route changes on the basis of socio-
21 economic factors.

22 A That's correct.

23 Q That's what you said?

24 A Yes

25 Q Mr. Dau, I'd like to
26 draw your attention again to Exhibit No. 54, the one
27 that I referred to earlier. At the same tab, 8-A-1
28 on page 5, the first complete paragraph on that page,
29 let me read the first sentence of that paragraph, it
30 says:

Dau, Williams, Mollard, Watson
Cross-Exam by Bell

1 "The east side of the Mackenzie River was
2 ultimately selected as the prime route, in
3 light of the fact that the government had
4 selected that side for its highway, and in
5 the knowledge that it would simplify the
6 process of making natural gas available for
7 the communities along the river."

8 I'd be interested to know how the location of the
9 highway relates to the location of the route in a
10 social or economic way as opposed to an engineering or
11 geotechnical way.

12 WITNESS DAU: May I have
13 the question again, please?

14 Q Yes, it says that in
15 making a route selection along the east side of the
16 Mackenzie, that one of the factors that was considered
17 was the fact that the government had selected that
18 side for its highway. Well, I draw your attention to
19 the heading of this section on page 4 which reads:

20 "Section 4. Socio-economic pipeline route factors."
21 I'm interested to know how the location of the highway
22 on the east side of the Mackenzie relates to the loca-
23 tion of the pipeline route in a social or an economic
24 way.

25 A I think the thing we're
26 trying to stress or are trying to bring out here is
27 the corridor had been established, once the highway was
28 located, and whether that's the socio-economic factor
29 or not I really don't know. I can't think of any
30 specific socio-economic factor relating to the highway

Dau, Williams, Mollard, Watson
CrossExam by Bell

1 on the pipeline that would cause us to move the
2 pipeline.

3 Q Can Mr. Williams help
4 you, perhaps?

5 WITNESS WILLIAMS: No sir.

6 Q Anybody else on the
7 panel? Is Arctic Gas going to bring a witness who
8 can answer that question?

9 MR. GENEST: We have a whole
10 socio-economic phase --

11 MR. BELL: This is route selection
12 Mr. Genest.

13 MR. GENEST: I can't tell you
14 right now, Mr. Bell. I'll have to consider it.

15 THE COMMISSIONER: What was the
16 question?

17 MR. BELL: We are trying to
18 unscramble the scrambled eggs here, Mr. Commissioner.
19 The applicant says that the location of the highway
20 was a factor in its route selection, and it comes under
21 a heading entitled:

22 "Socio-economic pipeline route factors,"
23 and I'm just at a loss to figure out how the location
24 of the highway relates to the location of the route
25 in a social or economic way, and I guess all the members
26 of the panel are at the same loss.

27 THE COMMISSIONER: Well, the
28 witness said, Mr. Williams said that he was unable
29 to identify any route change made on the ground of
30 socio-economic considerations.

Dau, Williams, Mollard, Watson
Cross-Exam by Bell

1 MR. BELL: Well, here we're
2 talking about --

3 THE COMMISSIONER: That is
4 what he said, wasn't it?

5 MR. BELL: Well, here we're
6 talking, sir, about why the east side of the Mackenzie
7 River was chosen, which I submit relates to the location
8 of the route. I would like an answer to that question
9 sooner or later.

10 Q Perhaps I could refer you
11 to that sentence again, Mr. Dau, the second part of it
12 which reads --well, I'll read the whole sentence again:

13 "The east side of the Mackenzie River was
14 ultimately selected as the prime route in
15 light of the fact that the government had
16 selected that side- for its highway and in the
17 knowledge that it would simplify the process
18 of making natural gas available for the
19 communities along the river."

20 Mr. Dau, as far as you're aware, is Canadian Arctic
21 Gas planning to build lines to supply gas to the
22 communities along the river?
23
24
25
26
27
28
29
30

Dau, Williams, Mollard, Watson
Cross-Exam by Bell

MR. GENEST: Well --

THE COMMISSIONER: Do you want
to answer that, Mr. Genest?

MR. GENEST: I think that
should be a question put to Mr. Horthy. With respect,
that's a matter of policy for Canadian Arctic Gas, he's
going to be here.

MR. BELL: Well, all I asked
was whether Mr. Dau was aware of any plans.

THE COMMISSIONER: Well, it
seems to me, Mr. Bell, that the statement of Arctic
Gas in Volume VIII, Exhibit 54, in a sense speaks for
itself. If you want to ask Mr. Dau if, so far as he
is concerned, he supports the view expressed here,
that one of the reasons this proposed route on the
right side -- not the right side --
-- the east side of the Mackenzie River is because they
were concerned that they should be in a position to
supply gas to the communities, that's a reasonable
enough question; but I don't think Mr. Dau should be
taxed with questions relating to policy.

MR. BELL: Very well, I'll
reserve that for Mr. Horthy then.

Q I'd like to refer you to
the same paragraph, the next sentence in that paragraph
which reads:

"On the other hand, the specific routing was
arranged to avoid interference with present
or future facilities of cities and villages

Dau, Williams, Mollard, Watson
Cross-Exam by Bell

1 by keeping appropriate distance away from
2 settlements,"
3 and I'd like to find out just what we're talking about
4 here when we say "appropriate distance away from
5 settlements".

6 I assume you had some socio-
7 economic advice in deciding what was an appropriate
8 distance away from the settlements?

9 WITNESS DAU:
A I don't recall any
10 specifically, I'm sure we did, sir, I can't specifically
11 recall any.

12 Q Are you familiar with the
13 location of the route and its attendant facilities in
14 relation to Fort Good Hope?

15 A I have a strip map.

16 Q Please refer to it.

17
18 A I have a map.

19 Q The route there runs
20 past Fort Good Hope at a distance of two or three
21 miles at its closest point?

22 A That's correct.

23 Q And at or near the
24 Community of Fort Good Hope the following facilities
25 will be located: A construction camp.

26 A Yes.

27 Q There will be upgrading
28 of the wharf.

29 A Yes.

30 Q There will be a material

Dau, Williams, Mollard, Watson
Cross-Exam by Bell

1 stockpile?

2 A Yes.

3 Q There will be a fuel

4 storage area.

5 A Yes.

6 Q There will be a communi-

7 cations tower.

8 A Yes.

9 Q A heli-pad.

10 A Yes.

11 Q Two bore pits.

12 A One's a preferred one, I

13 believe, and the other is an alternate.

14 Q I see; and 22 miles down

15 the Mackenzie approximately, to the north of Fort Good

16 Hope, the following facilities will be located: Four

17 miles of permanent road.

18 A Yes.

19 Q A compressor station.

20 A Yes.

21 Q A material stockpile?

22 A Yes.

23 Q Two bore pits.

24 A No, one preferred and

25 one alternate.

26 Q M-hm, and several miles

27 of temporary road.

28 A Yes.

29 Q And in the other direction

30 20 miles to the south of Fort Good Hope, the following

Dau, Williams, Mollard, Watson
Cross-Exam by Bell

1 will be located: A compressor station.

2 A Yes.

3 Q A construction camp.

4 A Yes.

5 Q A materials stockpile.

6 A YES.

7 Q A fuel storage area.

8 A Yes.

9 Q Two more bore pits.

10 Or is this again a --

11 A Yes.

12 Q -- example of the
13 preferred and alternate.

14 A I believe there's only
15 one shown there.

16 Q O.K., one bore pit, then.
17 A communications tower.

18 A Some distance away from
19 that location, yes.

20 Q M-hm, and a heli-pad?

21 A Yes.

22 Q Road access to the
23 southern location will be by winter road or the
24 Mackenzie Highway through Fort Good Hope.

25 A Yes.

26 Q And road access to the
27 more northerly location north of Fort Good Hope will
28 be also by winter road or the Mackenzie Highway.

29 A And by the permanent
30 road to the river.

Dau, Williams, Mollard, Watson
Cross-Exam by Bell

1 Q But if you want to go
2 over land you have to go along that road.

3 A Yes sir.

4 Q And it goes through Fort
5 Good Hope.

6 A Yes. It goes by Fort
7 Good Hope but I believe the road is further from the
8 community than the pipeline.

9 Q Did your socio-economic
10 advisors tell you that the work on the wharf and on
11 the air strip and on the camps and stockpiles, plus
12 the constant movement of crews and materials through
13 Fort Good Hope would produce a substantial physical
14 impact on the community?

15 A I don't specifically
16 recall that.

17 Q Did you ask them?

18 A I did not.

19 Q Did anybody?

20 WITNESS WILLIAMS: I do recall
21 a discussion of
22 this at that meeting, that week-long meeting. I don't
23 recall it being stated as firmly as you suggest.

24 Q Well, apparently then
25 the applicant does not consider physical impact on a
26 community to be relevant when deciding whether the
27 route location is appropriate with respect to that
28 community.

29 MR. GENEST: Mr. Commissioner,
30 again a conclusion which you should draw.

THE COMMISSIONER: I think

Dau, Williams, Mollard, Watson
Cross-Exam by Bell

1 that's argumentative. That's a point you can say the
2 Commission ought to take.

3 MR. BELL: Pardon me, Mr.
4 have
Commissioner. I/never cross examined anybody before.
5 I don't mean to be disrespectful. I'd like to refer again
6 to the same section of the application, Exhibit No. 54.
7 Exhibit No. 54, that's Section 8-A, tab 1, page 5 again,
8 and here we have the last paragraph in this section,
9 Section 4, where the applicant states that he's been
10 guided by a substantial number of suggestions by
11 socio-economic consultants and other northerners, rel-
12 ative to the location of such facilities, and he
13 gives examples. Mr. Dau, I'd be interested to know
14 who these other northerners are.

15 WITNESS DAU: That contact
16 with the northerners was through our client, Canadian
17 Arctic Gas. Northern Engineering itself did not make
18 those contacts.

19 Q I see, so is there
20 anybody else on the panel who could answer my question?

21 A Apparently not, it would
22 have to come from the applicant, Canadian Arctic Gas.

23 MR. BELL: Perhaps when Mr. Genest
24 is finding somebody who can answer my previous question
25 he can also find somebody who can answer that one.

26 MR. GENEST: Go on--

27 MR. BELL: Now this exhibit
28 also suggests that your socio-economic consultants
29 were also northerners. Do you know who they were?
30 It says:

Dau, Williams, Mollard, Watson
Cross-Exam by Bell

1 "Socio-economic consultants and other northerners."

2 A The two I'm aware of are
3 Gemini North and we also I seem to -- yes, we got some
4 information from Mr. Sibbeston, who was retained by
5 Canadian Arctic Gas for some period of time.

6 Q Is that Mr. Nick Sibbeston?

7 A Yes.

8 Q Can you remember anybody
9 else?

10 A No, I can't recall any
11 others

12 Q Do you know if they asked
13 any of the people who lived in the communities?

14 A That question would have
15 to go to -- I don't know. I'm sure they had conversa-
16 tions with them, but specifically who they talked to
17 I can't help you.

18 Q I'm sure that Mr. Genest's
19 new witness will be able to answer that one, too.

20 I would ask you just to turn
21 a few pages along this exhibit to page 9. The first
22 paragraph on page 9 under the heading:

23 "Item 6. Location of the above ground facilities,
24 6.1, compressor stations and associated facilities."
25 This reads as follows:

26 "The four major criteria which govern location
27 of compressor stations along a pipeline route
28 are: Pipe specifications, primarily diameter
29 and allowable operating pressure; gas flow
30 and temperatures; compressor station sizes; and

Dau, Williams, Mollard, Watson
CrossExam by Bell

1 gas volumes. Following the hydraulic determination
2 of locations, geotechnical, socio-economic and
3 environmental factors must be reviewed. "

4 In reviewing the socio-economic factors for the compres-
5 sor stations, did the applicant follow the same proced-
6 ure as it did with respect to the location of the route?

7 A Yes.

8 Q So we can't expect any
9 reports or answers on the basis of -- I'm sorry, I
10 shouldn't make that suggestion. You don't have any
11 reports to which you can refer to help us on the question
12 of the location of compressor stations?

13 A In the socio-economic --

14 Q Yes.

15 A No.

16 Q But there are lots of
17 reports on the engineering side.

18 A Yes.

19 Q Could I ask you to refer
20 to the application again? This is Exhibit No. 66, en-
21 titled -- well, this is the Fort Simpson route change
22 amendment and it's at tab 8-A, entitled:

23 "Location of facilities."
24
25
26
27
28
29
30

1 THE COMMISSIONER: What
2 exhibit is that?

3 MR. BELL: It is number
4 66, sir.

5 MR. GENEST: Fort Simpson?

6 MR. BELL: Yes, that is
7 right.

8 THE COMMISSIONER: Yes, that is
9 right.

10 MR. BELL: At page three of
11 that tab there is an item there, number 4 which reads:
12 "Socio-Economic pipeline route factors. The applicant
13 is aware of no socio-economic consequences of any
14 significance relating to the new routing which are
15 different from the socio-economic consequences of the
16 route that was selected in March 1974. The new
17 routing is closer to Fort Simpson on the other
18 side of the river but would be constructed, maintained
19 and operated by the same techniques and staff as
20 previously planned."

21 Is this what your socio-
22 economic consultants advised you?

23 MR. GENEST: That is a statement
24 by the applicant again, Mr. Bell.

25 MR. BELL: No, it relates
26 to facilities locations, Mr. Genest. I do not under-
27 stand why you do not have somebody on this panel
28 who can answer this question.

29 MR. GENEST: Well, we are
30 going to have panels here for months and months and

1 there is a socio-economic phase and we are going to
2 have a lot of people responding to this kind of ques-
3 tion and by whose evidence this kind of statement can
4 be tested.

5 MR. BELL: Well, I do not
6 want to get into an argument with you, Mr. Genest,
7 but you have got Dr. Mollard on there who is a --

8 MR. GENESE: He is a terrain
9 typist.

10 MR. BELL: I do not understand
11 why you cannot have a socio-economic man on there too.

12 THE COMMISSIONER: Well, let's
13 just --

14 MR. BELL: I will continue on
15 --

16 THE COMMISSIONER: Let's
17 just hold on a minute. The schedule for
18 the week commencing March 11th distributed by Mr.
19 Waddell reads: "I am informed that the applicant,
20 Canadian Arctic Gas, will be calling the following
21 panels: 1) Facilities Location (Application Section
22 8(a)..)" Now, if that was the information supplied
23 by Arctic Gas to Mr. Waddell, Mr. Bell is entitled
24 to question these witnesses about the contents of
25 volume 8 (a) of the application, but I think that once
26 it is apparent, Mr. Bell, that these witnesses are
27 devoid of any knowledge on the subject, that once
28 you have made the point -- that is certainly legitimate
29 for purposes of cross-examination, but I think that
30 we can leave it there in each instance.

1 MR. GENEST: Sir, I would
2 like to add to that, if I might be permitted to
3 do so, that we have to contend with the phases into
4 which your rulings have divided ~~these~~ hearings and
5 these -- as you have pointed out yourself in the
6 rulings -- these are intermingled, but to have some
7 organization, we were going to deal with the
8 engineering aspects of the matter first and go into
9 impacts, various impacts, including the human environ-
10 ment and I was prepared to deal with the engineering
11 aspects and at a later stage certainly all of these
12 matters, it seems to me when we come to treat the
13 socio-economic factors, can be dealt with including
14 route selection and the effect of route selection.

15 THE COMMISSIONER: Excuse
16 me, Mr. Scott?

17 MR. SCOTT: Mr. Commissioner,
18 on the other hand as my friend would say, it should
19 be observed that the panel has indicated, that in
20 route selection, they have received input of environ-
21 mental and socio-economic type which bears on route
22 selection. Now, the panel has said that they cannot
23 recall any instance in which the socio-economic input
24 led to a variation of the route and I presume what
25 Mr. Bell is saying is that this is a case where you
26 have said that the input will not lead to a variation
27 of the route because the input is equivalent -- or the
28 impact of the input is equivalent for both alternatives.

29 It seems to me, in my res-
30 pectful submission, that it is a matter that might

1 be probed. Mr. Genest says it will be dealt with later.
2 WE are getting an increasingly long list of things
3 that he is going to deal with later --

4 THE COMMISSIONER: Well, I
5 was hoping that somebody would signal me that it was
6 time to adjourn for coffee --

7 MR. SCOTT: May I make my
8 first truly creative suggestion of the morning,
9 Mr. Commissioner.

10 THE COMMISSIONER: Mr.
11 Bell, let me make it clear that I think that your
12 line of cross-examination is entirely legitimate.
13 As I understand it, you are seeking to determine whether
14 in the selection of the route, social and economic
15 factors were considered. Whether they had any
16 weight when they were put in the scales, along with
17 the engineering considerations. Now, do not think
18 that you are being limited in any way in that regard
19 -- my only concern is that once you have made your
20 point and you have made them well for someone who
21 claims to be a neophyte, I think that you can appre-
22 ciate that I will get the point and we can carry
23 on -- so we will carry on and have a cup of
24 coffee now.

25 (PROCEEDINGS ADJOURNED)
26
27
28
29
30

(PROCEEDINGS RESUMED PURSUANT TO ADJOURNMENT)

MR. SCOTT: Mr. Genest

took me aside when I was trying to have a peaceable cup of coffeee and apparently misinterpreted my last observation in respect of Mr. Bell's question. I want to emphasize that I was asserting that I thought the question was proper. I was not complaining about the constitution of the panel, per se, and he wanted my formal assurance that that was so.

MR. BELL: Mr. Commissioner, perhaps I should just observe at this time that the reason that I am asking some of these questions is that I do not want to be put in the position of asking them later on in the socio-economic phase and Mr. Genest stands up and says you should have asked that back in phase one.

MR. GENEST: I doubt if I would ever do that, sir.

THE COMMISSIONER: I cannot believe it.

(LAUGHTER)

MR. BELL: Mr. Williams, would you pick up the transcript that we have been using this morning, volume number 15 and turn to page 1666. At line 15 and following. This is the list of eight criteria which Mr. Dau told us about the other day, which are involved in route selection and I would just like to remind you of them again and I would like to read this passage from the transcript. It reads as follows:

1 "The criteria which were established
2 for route location were as follows: with
3 all factors being equal the most economical
4 pipeline route is the shortest distance between
5 the source of supply and the point of
6 delivery. From this base adjustments
7 were made to take into account the
8 following: 1) the proximity of the
9 pipeline to other known and probable
10 future sources of supply, 2) terrain
11 barriers including mountain ranges,
12 lakes and rivers, 3) other topographic
13 features, surface vegetation and land
14 use, 4) soil characteristics and slope
15 stability, 5) access for constuction and
16 future maintenance and operation..."

17 And over the page on 1667:

18 "...6) consideration for wildlife, including
19 mammals, fish and birds, 7) proximity of
20 large urban centres, and in this particular
21 route there is no concern of course with
22 large centres, 8) in permafrost terrain
23 which is the main factor that makes this
24 project different from other major pipeline
25 projects ..."

26 I must say that I agree with that,

27 "... the avoidance of side hill locations in
28 high ice content, fine grained soils, degradation
29 of thermokarst areas, unstable banks at river and
30 stream crossings and avoidance of areas of

1 potential pipeline bouyancy."

2 Mr. Williams, I would
3 like to direct your attention to criterion number
4 three: "other topographic features, surface vegetation
5 and land use." What does land use refer to? Could
6 you give us an example or two?

7 WITNESS WILLIAMS:

8 A Well, for instance
9 in Alberta, where you have agricultural land and
10 farm buildings, we would certainly like to keep the
11 route away from the farm buildings or through some-
12 body's garden patch, things like that. In the
13 north it did turn out that we thought we were
14 reasonable distances from communities. I do not
15 think that there is anything under two miles, that
16 allows for future expansion of those villages
17 without the pipeline interferring. I think we have
18 mentioned earlier that in the week seminar there
19 was discussion of the traditional hunting and trapping
20 area east of Arctic Red River. It so happens, that
21 I think we have said in one of the reports,
22 that there is no free-hold land crossed by the
23 pipeline north of 60 -- that it is Crown land --
24 certainly some falls within the jurisdiction of the
25 municipalities concerned --

26 Q Mm-hmm-- thank you.

27 I believe that it was mentioned earlier this morning
28 that there were not any socio-economic reports upon
29 which the panel relies. I think I might have
30 found one. I would refer your attention to -- direct

1 your attention to the list of reports -- this is
2 exhibit no. 73 at page six, number 311 which is entitled,
3 "Status of Lands Required for Pipeline Right-of-
4 Way and Ancilliary Facilities, Yukon and N.W.T.,
5 in this list
6 November 1973". Its inclusion/indicates that you
7 are relying on this report.

8 Mr. Williams, do you have a
9 copy of this report? Could you get one?

10 A Yes, sir.

11 Q Would you describe this
12 document for the Inquiry? Could you start with the
13 covering letter.

14 A I am sorry, did you
15 suggest reading the covering letter?

16 Q Yes, if you would not
17 mind. It is not very long.

18 A Yes, this is a letter
19 dated November the 2nd, 1973, on Northern
20 Engineering Company Limited stationery from D.M. Fox,
21 an employee of Northern Engineering to Mr. W.W.
22 Brachett, Vice-President of Corporate Affiars,
23 Canadian Arctic Gas Study Limited, Toronto, and it
24 says:

25 "Attached is one copy of report entitled 'Status
26 of Land Required for Pipeline Right-of-Way and
27 Ancilliary Facilities, Yukon and Northwest
28 Territories." We believe the report and
29 accompanying maps to be complete in themselves,
30 however, if you require additional information
or wish to discuss the report, please advise.

1 If you desire additional copies, they
2 can be supplied in short order. One
3 copy of the text has been forwarded to
4 Mr. G.W. Walker, Director of Engineering
5 at your Calgary office."

6 Q And I see two small
7 "c"'s down in the left hand corner, followed by
8 a name, G.L. Williams. Is that you, sir?

9 A Yes, sir.

10 Q Does that indicate that
11 you received a copy of this letter and this report?

12 A Certainly a copy of the
13 letter and I would imagine a copy of the report
14 also.

15 Q There is a handwritten
16 notation on the letter. Could you read that for us
17 too, please? It looks to me like it says, "Maps
18 still with N.E.S., \$60 per set" and there are
19 some initials under that. Do you recognize this hand-
20 writing at all? I guess you do not if you cannot
21 read it. Although I have that problem sometimes
22 with my own.

23 A I am sorry, I --

24 THE COMMISSIONER: What
25 exhibit is this?

26 MR. BELL: This is not an
27 exhibit sir, I am going to ask eventually Mr.
28 Genest to file this as an exhibit. This is a report
29 on the list of documents which the panel is relying
30 on.

1 MR. SCOTT: Perhaps it
2 should be filed as an exhibit now so it can be
3 referred to so we will not have to remember later
4 that we referred to it and forgot to file it.

5 MR. BELL: There is one
6 thing we should take into consideration. Now,
7 the maps referred to in the letter are not included
8 in this report. They were not in Arctic Gas's library
9 and I just wonder whether they should be included
10 in the exhibit and all filed at the same time or
11 whether two filings would be proper.

12 MR. SCOTT: Mr. Commissioner,
13 to be orderly, this document has been referred to
14 as it is referred to. I think it should forthwith
15 be given an exhibit number and a copy produced to
16 Miss Hutchinson as the Secretary. If my friend
17 wants to file anything else later on he can do so
18 in the usual way.

19 THE COMMISSIONER: I think
20 that it is your copy that Mr. Scott is referring
21 to.

22 MR. BELL: Yes, well --

23 THE COMMISSIONER: You
24 carry on, but it ;should be marked exhibit 73 ____
25 it will be marked exhibit 73 when you are through with
26 it.

27 MR. GENEST: Mr. Commissioner, I
28 was just referring to a list of documents, there is an
29 exhibit number that is nigher than the one --
30 I think you are right. We filed lists of the

1 qualifications of the witnesses and a list of
2 documents. Miss Hutchinson may have missed.

3 THE COMMISSIONER: Well,
4 what I think that we will do is -- when we adjourn
5 Mr. Marshall and Miss Hutchinson and anybody
6 else who wants to get into the act can sort out
7 the numbers and in the meantime we will carry on.

8 MR. BELL: I think that
9 we have identified the document sufficiently in
10 the record at any rate.

11 (LETTER AND REPORT MARKED AS EXHIBIT NO. 75)

12 MR. BELL: Okay, I would
13 like to refer you to the first page of the report.
14 and ask you Mr. Williams, to read the title of the
15 report and the paragraph entitled "Introduction"
16 outloud for the INquiry.

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Dau, Williams, Mollard, Watson
Cross-Exam by Bell

1 A The first word at
2 the top is "Report".

3 "Status of land required for pipeline right-
4 of-way and ancillary facilities -- Yukon and
5 Northwest Territories. Introduction, it has
6 been apparent for some time that CAGSL will
7 be required to present certain portions of
8 its National Energy Board application for a
9 certificate of public convenience and necessity
10 to DIAND for their review and approval prior
11 to the time of National Energy Board applica-
12 tion. When DIAND has approved the project in
13 principle, as it would apply to the Yukon and
14 Northwest Territories, negotiations will have
15 to be undertaken with DIAND, the major land-
16 owner, to set out the terms and land tenure
17 for the pipeline, and its ancillary facilities.
18 This report has been prepared for the purpose
19 of acquainting those who must negotiate the
20 terms of land tenure with present land status."

21 Q Thank you. There
22 follows then a brief section entitled:

23 "Back ground"

24 which describes the main types of land holdings in
25 the Territories, being freehold and Crown land. It
26 then describes types of dispositions which stem from
27 Crown land, such as dispositions of sand, gravel,
28 rock, etc., timber, petroleum and natural gas rights,
29 and minerals.

30 Mr. Williams, I direct your

Dau, Williams, Mollard, Watson
Cross-Exam by Bell

1 attention to page 3 of the report and would refer you
2 to the first complete paragraph, the first unnumbered
3 paragraph on that page which reads as follows:

4 "Another type of interest in Crown land that
5 we have considered is the right of individuals
6 or groups to hunt or trap on Crown lands. The
7 Game Branches of the respective Territorial
8 Governments regulate these activities. While
9 the holders of such rights have no recorded
10 interest in the surface, we have been advised
11 by a Federal Government official that the rights
12 of hunters and trappers must be considered if
13 such rights are affected by the pipeline or
14 its ancillary facilities."

15 There then follows a section entitled:

16 "Searching procedure,"

17 in which the author describes the manner in which he
18 went about finding out about the types of dispositions
19 that exist in the Territories. This is then followed
20 on page 5 by a section entitled:

21 "Search results,"

22 in which he tells us about the results he attained
23 with respect to freehold land, Crown land, mineral
24 disposition, and over on page 7, development control
25 zones, and also on page 7, traplines, and trapping and
26 hunting areas. These are the results of his search.
27 Perhaps I could ask you, Mr. Williams, if you wouldn't
28 mind, just to read the first two or three sentences
29 in the paragraph that is entitled:

30 "Traplines, and trapping and hunting areas,"

Dau, Williams, Mollard, Watson
Cross-Exam by Bell

1 on page 7.

2 WITNESS WILLIAMS:

3 "Traplines, and trapping and hunting areas.

4 A great number of recorded or registered trap-
5 lines, registered trapping areas, group trapping
6 areas, etc., have been located. This information
7 has been plotted on the attached maps. We would
8 expect that dealing with the holders of these
9 various rights will be extremely difficult,
10 perhaps the most difficult task in connection
11 with the right-of-way acquisition process."

12 Q Thank you.

13 THE COMMISSIONER: What is
14 the date of that letter?

15 A November 2, 1973.

16 MR. BELL: The rest of the
17 report is entitled: "Discussion of lands
18 to be traversed,"
19 and it confirms possible conflicting land uses along
20 the proposed route, and lists them. I'd like to refer
21 to some of these but not all of them, it's quite a
22 lengthy list, and I would direct your attention, Mr.
23 Williams, to page 10 of the report. The first paragraph
24 on that page reads:

25 " At MP-106 the route appears to be close to lot 2
26 group 1305 covered by an agreement of sale to
27 Canadian National Railway. Directly east of
28 this point a communications tower is proposed
29 which appears to lie in close proximity to a
30 recorded trapline held in the name of Edward

Dau, Williams, Mollard, Watson
Cross-Exam by Bell

1 Nazon."

2 Skip a paragraph, at paragraph 3 of that page it
3 reads as follows:

4 "At MP-123 the route appears to enter a registered
5 trapping area held in the name of Edward Nazon."

6 Have you told Edward Nazon about this?

7 A Personally, no sir.

8 Q Do you know if anybody
9 has?

10 A I don't have any first-
11 hand information, no.

12 Q Look at paragraph 5 on
13 that page, it reads:

14 "South of MP-144 communications tower site
15 N-03-A is proposed which lies within a
16 registered trapping area held in the name of
17 Hyacinthe Andre ."

18 Do you know if / Hyacinthe Andre has been told about
19 this?

20 A No sir, I do not.

21 Q At the next paragraph
22 it reads:

23 "At MP-152 the pipeline right-of-way crosses
24 a recorded trapline held in the name of Gabe
25 Andre ."

26 Do you know if Gabe Andre has been told about this?

27 A No sir.

28 Q Please turn to page 12,
29 the second last paragraph on page 12 reads as follows:

30 "MP-297 pipeline right-of-way will cross

Dau, Williams, Mollard, Watson
Cross-Exam by Bell

1 recorded trapline held by Gabe Kelly."

2 Do you know if Gabe Kelly has been told about this?

3 A I do not know.

4 Q Will you turn to page
5 16 of the report, please?

6 MR. SCOTT: I haven't
7 Would it be helpful
8 had the advantage of seeing the report. If my friend
9 simply asked if any of the persons who are disclosed
10 in the report as being owners of registered traplines
11 had been notified, I suspect none of them have and
12 we could really save about 15 pages of questions.
13 I presume that's not inconsistent with MR. Bell's --

14 MR. BELL: I would agree with
15 Mr. Scott except that in certain cases the type of
16 concept is different. In some cases you have the
17 route crossing and in other cases you have above-ground
18 facilities located within a trapping zone.

19 MR. SCOTT: Well, it was just
20 a suggestion. I withdraw it.

21 MR. BELL: Well, perhaps I
22 could try and shorten it a bit, because I have a list
23 of about 20 people here.

24 Q Well, I'll just point
25 them out to you, Mr. Williams. ON page 16 in paragraph
26 4 we notice the name Boniface Nayally and on the same
27 page down in the second last paragraph we notice the
28 name Johnny Yendo. Over the page on page 17 we notice
29 the name of Paul Moses. Again Johnny Yendo in the second
30 paragraph. Johnny Yendo again in the third paragraph.
In the next paragraph Fred Clillie is mentioned. In the

Dau, Williams, Mollard, Watson
Cross-Exam by Bell

1 final paragraph there's the mention of a name Yendi,
2 and I am informed that that is not the same person as
3 Johnny Yendo but refers to one or more of three people,
4 Harry Yendi, Jimmy Yendi, or Louis Yendi.

5 Over on page 18 there's a
6 reference to the name Boots, and I'm informed that
7 that name refers to Mr. George Boots. B-O-O-T-S.

8 THE COMMISSIONER: How do
9 you spell Yendo?

10 MR. BELL: Y-E-N-D-O.

11 MR. SCOTT: There is also
12 Yendi, ending in "I".

13 MR. BELL: Yes, I just
14 explained that, Mr. Scott. It refers to either Harry
15 Yendi or Willy Yendi or all of them, or any two of
16 them. Over on page 19 we have the names of Ed, George
17 and Baptiste Saulteaux. On the same page, Ernest
18 Tsetso, that's T-S-E-T-S-O. Saulteaux is S-A-U-L-T-
19 E-A-U-X. On the same page the route crosses -- well, it
20 doesn't cross it on the page but it's mentioned on the
21 page, the trapline held by David McPherson and John
22 and Ernest Michel and finally on page 20 the name
23 of Mr. Ed Jumbo is also mentioned.

24 I would like to point out just
25 one other paragraph, it's on page 20 at the top, and
26 I thought I should draw particular attention to this
27 to demonstrate that I was telling Mr Scott the truth
28 earlier. It reads as follows:

29 "MP-742 to MP-764, the pipeline route lies
30 within registered trapping area No. 341."

Dau, Williams, Mollard, Watson
Cross-Exam by Bell

1 There is apparently no name we can find for that.

2 "Also located within the trapping area are 2
3 borrow pits, a compressor station site M-17
4 and a 3,000-foot air strip."

5 I would point out to the Commission that these are
6 registered traplines only, and there are probably a
7 dozen if not hundreds of unregistered traplines in the
8 Mackenzie Valley.

9 Q Mr. Williams, have you
10 attempted or do you know if Northern Engineering
11 Services has attempted to ascertain potential conflicts
12 with traplines that are not registered?

13 A I'm reasonably sure that
14 Northern Engineering has not performed that service.
15 However, I am aware that several maps of the route
16 have been published and I'm aware that members of
17 Canadian Arctic Gas and their consultants have visited
18 various communities where they have no doubt had more
19 detailed maps and have discussed these things with
20 interested people in the communities. I would suppose
21 that --

22 Q Who has told you that?

23 A Staff members of Canadian
24 Arctic Gas. I would suppose that no doubt, I would be
25 surprised if they hadn't personally contacted some of
26 these people. In addition, I would like to say that
27 the maps that were put ⁱⁿ the response for additional
28 information include the names of these trapping areas
29 and the -- I'm sorry, the registered names of the
30 owners of the trapping areas.

Dau, Williams, Mollard, Watson
Cross-Exam by Bell

1 Q Is that the ground
2 lines that was indicated?

3 A Yes, I think it's
4 question 7.

5 Q That's Exhibit No. 70.
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Dau, Williams, Mollard, Watson
Cross-Exam by Bell

1 So that the maps are in fact before the Inquiry, is that
2 right?

3 A Yes sir.

4 Q And --

5 A They are not --

6 Q -- they correspond to the
7 list of items that I read out?

8 A I know that several of
9 the names you just mentioned are included in the maps
10 in response to question 7. I'm not -- I can't say that
11 this is the same map that is referred to in the covering
12 letter of that report. I would think that the one in
13 response to question 7 is the most recent knowledge that
14 we have. It may supercede the one that accompanied
15 the letter.

16 Q But as far as you are
17 aware there are no maps relating to traplines which are
18 not registered?

19 A The report makes reference
20 to registered traplines. They were discovered by going
21 through the registry of wherever these things are
22 kept, but it does not refer to unregistered traplines,
23 and I assume that the maps that are attached to this
24 report refer only to the registered traplines and not
25 to the unregistered traplines. Is that a fair
26 inference?

27 MR. GENEST: Doesn't that
28 speak for itself, Mr. Commissioner?
29
30

Dau, Williams, Mollard, Watson
Cross-Exam by Bell

1 MR. BELL: Perhaps Mr. Genest
2 can help us.

3 MR. GENEST: I really can't
4 without reading them again, Mr. Bell. If you've
5 looked at it, I'm prepared to accept your assurance
6 as to --

7 MR. BELL: Well, perhaps I'll
8 accept your suggestion that the map speaks for itself.

9 Q Mr. Williams, can you
10 tell me what role this particular report played in
11 selection of a route?

12 A It made us aware of these
13 land use situations. We did examine them and decided
14 that for the time being at least that they were so
15 extensive that a route revision to avoid all of them
16 was out of the question.

17 Q You mean you'd just
18 run into other ones if you tried to move the route.

19 A If it indeed was feasible
20 to move that far.

21 MR. BELL: I'll yield to Mr. Bayly.

22
23 THE COMMISSIONER:

24 Q Mr. Williams, just so
25 I understand where we're at, the presence of a
26 multitude of registered and unregistered traplines
27 was known to Northern Engineering and in fact discussed
28 in the report that has been read, is that right?
29 Now putting to one side the meetings that Arctic Gas
30 may have held, which no doubt we shall hear about

Dau, Williams, Mollard, Watson
Cross-Exam by Bayly

1 from the people who held them, you're not aware of
2 any consultation, any notification given to or consul-
3 tation with any of the owners of registered or unregis-
4 tered traplines in connection with this selection of
5 the route?

6 A That is correct, sir, I
7 am not aware of that.

8 Q And in fact there was no
9 alteration made in the choice of the route because of
10 the presence of these registered and unregistered trap-
11 lines?

12 A To the best of my knowledge
13 that is correct, sir.

14 THE COMMISSIONER: Mr. Bayly --

15 MR. GENEST: I might assist on
16 the question of what those maps show in the responses,
17 Exhibit 70, paragraph 7 at page 72 is the relevant
18 paragraph. It says that --

19 THE COMMISSIONER: Would you
20 just hang on a second?

21 MR. GENEST: Right.

22 THE COMMISSIONER: Exhibit 70?

23 MR. GENEST: Exhibit 70, it's
24 questions and responses, you just have to flip the
25 pages until you come to 7-2, sir. It's a response to
26 question 7, the pages aren't numbered.

27 MR. MARSHALL: Just ahead of
28 the fold-out.

29 THE COMMISSIONER: Yes, thank
30 you, I have it.

Dau, Williams, Mollard, Watson
Cross-Exam by Bayly

1 MR. GENEST: We've tried to
2 indicate both registered and unregistered, and it says
3 that:

4 "It should be noted that the traplines may
5 change from year to year but the registered
6 traplines are not necessarily used by those
7 in whose name they are registered."

8 CROSS EXAMINATION BY MR. BAYLY:

9 MR. BAYLY: Q Mr. Dau and Mr.
10 Williams, I'd like to address my first questions to
11 you, if I may, and I'd like you to refer, if you would,
12 to Exhibit 54, which is Section 8 or Volume 8, excuse
13 me, of the application, and I would refer you to 8-1,
14 8-A-1 at page 4 and dealing with points from pages
15 4 to 6 involving the criteria for route selection,
16 Mr. Dau, I wonder if you could tell me, please, if
17 I understand your evidence correctly, that in develop-
18 ing a route you start to begin with, with the most
19 direct route, is that correct?

20 A Yes.

21 Q And then you go to what
22 I think is referred to in the application, Volume 8,
23 as -- and I'm referring to page 4 under item 3, the
24 second paragraph:

25 "Originally known factors including likely
26 socio-economic and environmental effects."

27 Could you tell us, please, what some of those originally
28 known factors were that led you to choose the route
29 you did as the prime route?

30 A It would be the general

Dau, Williams, Mollard, Watson
Cross-Exam by Bayly

1 knowledge of an area.

2 Q All right.

3 A Previous trips or that
4 type of information.

5 Q Was that knowledge that
6 was generated by Northern Engineering Services or was
7 that something that you consulted somebody else on?

8 A No, it's knowledge that
9 the individual would have in the course of their
10 work.

11 Q All right, could you
12 describe some of that knowledge, please, that went
13 into the considerations?

14 A In my own case, I drew
15 on the knowledge that I had acquired in the past in
16 route location and in making trips in certain areas,
17 and I was familiar with Northern Alberta, parts of
18 British Columbia. I had been in the Yukon, and I had
19 a general knowledge of the area.

20 Q All right.

21 A I would take that into
22 account, in selecting a route.

23 Q All right, could you
24 describe your general knowledge of the social and
25 economic condition of your prime route choice at
26 the time that it was made?

27 A In the early stage of
28 selecting a route?

29 Q Yes.

30 A It would be very minimal.

Dau, Williams, Mollard, Watson
Cross-Exam by Bayly

1 Q All right, and did you seek
2 outside counselling to increase this knowledge, or was
3 the decision made without that kind of counselling?

4 A At that stage, without
5 outside knowledge.

6 Q All right, and was the
7 choice of the prime route determined prior to acquiring
8 that knowledge?

9 A No sir.

10 Q All right, at what stage
11 did that knowledge come in and who did it come from?

12 A It was, I think I men-
13 tioned previously, Northern Engineering did not retain
14 consultants in that area, they were retained by Canadian
15 Arctic Gas who through courses of normal day to day
16 business and meetings and so on, they would have our
17 information as we developed it.

18 Q All right, was the prime
19 route selection done by Northern Engineering Services
20 or Arctic Gas using your input as well as input from
21 other people?

22 A Some areas of -- some
23 locations on the prime route were selected by people
24 other than Northern Engineering. Just remember, in
25 going back, that there was a merger to two groups,
26 and at the stage of the merger there were -- we had
27 different routes in different locations. Once the
28 two groups merged, Northern looked at all of the routes
29 and has agreed that this is an appropriate route.
30 Now the initial stage you're talking about, there may

Dau, Williams, Mollard, Watson
Cross-Exam by Bayly

1 be sections of the route that were originally selected
2 by someone other than personnel of Northern, but since
3 that stage we have looked at it and agreed it's an
4 appropriate route.

5 Q All right. Did you as
6 Northern Engineering Services choose a prime route prior
7 to discussion with Arctic Gas about other considerations
8 that they had other consultants working on?

9 A No sir. We did not choose
10 the prime route prior to talking to Arctic Gas.

11 Q All right, and they then
12 I assume had an input into the prime route selection,
13 is that correct?

14 A Oh yes.

15 Q And did they tell you
16 that certain parts of the route had to be changed for
17 reasons other than the engineering reasons you've
18 put forward?

19 A Not to my knowledge.

20 Q All right, you have
21 referred in your evidence earlier, to discussing the
22 cross-delta proposal, and because of input from environ-
23 mental concerns and people that you had on a consult-
24 ing basis, you determined at one time that that was
25 not an appropriate route. Is that correct?

26 A No, that's not quite
27 correct. I think the best way to state that is to
28 say that at that time, which is that early time, it
29 was more a case that we assumed it was not an approp-
30 riate route.

Dau, Williams, Mollard, Watson
Cross-Exam by Bayly

1 Q Did you assume that as
2 engineers, or did you assume it because you had cer-
3 tain people on your staff who came from other discip-
4 lines and suggested it might not be?

5 A I'm sure there was an
6 input from other disciplines in that decision at that
7 time.

8 Q All right. The reason
9 I refer to this sort of thing is because if we look
10 at the same volume, but at page 5, the first full
11 paragraph , it talks about what Mr. Bell was discussing
12 with you, Mr. Dau.

13 "Pipelines being appropriate distances from
14 settlements."

15 Now I'm assuming that at some point either Northern
16 Engineering Services or Arctic Gas made some sort of
17 a decision as to what an appropriate distance from a
18 settlement is, is that correct?

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DAu, Williams
Mollard, Watson
Cross-Exam by Bayly

1951

1 A Yes.

2 Q All right, did

3 Northern Engineering Services make that decision on
4 its own?

5 A No, I am sure that
6 it must have been in consultation with Canadian Arctic
7 Gas. I cannot specifically give you an example.

8 Q All right, may I suggest
9 a hypothetical and perhaps you can tell me whether
10 this is the sort of way these things are done.
11 Did you get a directive from Arctic Gas saying you
12 must not put your pipeline any closer than such
13 and such a number of miles from a settlement?

14 A No, I am sure we did
15 not.

16 Q So an appropriate --
17 you got no direction then on what an appropriate
18 distance was when you and Arctic Gas selected the
19 prime route?

20 A It was developed in
21 consultation and discussions with the staff, the
22 technical staff at Canadian Arctic Gas.

23 Q All right, did you
24 do it on a settlement by settlement basis?

25 A I suspect not, sir,
26 I cannot recall doing it that way.

27 Q The difficulty I am
28 having, Mr. Dau, is suddenly we have a statement
29 that the pipeline must be an appropriate distance
30 from settlements and we do not know where that

Dau, Williams
Mollard, Watson
Cross-Exam by Bayly

1952

1 came from. Perhaps Mr. Williams has some idea where
2 that came from.

3 WITNESS WILLIAMS:

4 A I think we should go
5 back to the April -- was it April '73 seminar --
6 prior to that time all consultants, biological and
7 socio-economic consultants had copies of the proposed
8 route. They had ~~the~~ for study for several months
9 prior to the meeting, and during the meeting some of
10 these questions were discussed and I do not recall
11 ever hearing any firm recommendation that the route
12 be altered because of proximity to communities or
13 urban centres or what have you -- there was no
14 firm recommendation that came forward at that meeting.
15 Now, there is the one that I mentioned previously
16 with respect to the traditional trapping area west --
17 I am sorry, east of Arctic Red River. It was
18 suggested by the socio-economic consultants that
19 it would be nice if the route could be altered there.
20 This was discussed at some length and it was agreed
21 that the extra mileage that would be added was
22 prohibitive from an engineering aspect and it was
23 agreed that we would -- except for making the
24 major change at Travaillant Lake Junction, -- that that
25 leg from Arctic Red to the ^{new} Travaillant Lake Junction
26 would go in more or less a direct route which does
27 cross this traditional hunting area.

28 Q All right, then with
29 that exception at that April 1973 meeting the prime
30 route that you have presented for us during the last

1 few days had been in effect selected and was not
2 protested except with --

3 A Except in the areas that
4 we had discussed in the last day or two, yes.

5 Q All right. Do you
6 know how it came about that you so happily got the
7 appropriate distance from the communities prior
8 to this seminar?

9 A Well, certainly as
10 participant in the route selection, this is a consider-
11 ation of the locator. He does not want to go down
12 the main street of a community. That gives problems
13 to the locator as well-- probably as well as the
14 community.

15 Q All right, then would it
16 be fair to say that Northern Engineering Services,
17 because of experience in building and planning
18 facilities of this nature, made the decision of
19 what was appropriate and this was approved by the
20 various consultants at your April 1973 seminar?

21 A Northern Engineering
22 made recommendations in concert with staff of
23 Canadian Arctic Gas, yes.

24 Q All right, and was
25 this the first plan for a pipeline in the Northwest
26 Territories in which you had made route selection
27 recommendations?

28 A No, sir, Mr. Dau referred
29 a day or two ago about the original study out of
30 the Pointed Mountain area that does traverse the

1 North west Territories and I think part of the
2 Yukon Territory.

3 Q All right, is an assum-
4 ption made in the Pointed Mountain and the Arctic Gas
5 application that it is appropriate to put facilities
6 say, outside the main street area, as you have
7 described it, of communities and if so, how is that
8 decision arrived at?

9 A I am sorry, I did not
10 quite follow that.

11 Q You have told us, Mr.
12 Williams that the route selector considered it
13 appropriate to put the facilities outside the
14 communities at what he said was an appropriate
15 distance. Now, what I want to know is, is what is
16 an appropriate distance, either in Pointed Mountain
17 or southern pipelines an appropriate distance in the
18 Northwest Territories. IN other words, was that
19 considered?

20 A I am not sure that
21 the two situations are analogous when speaking of
22 large communities in the south as compared to very
23 small communities in the north, but certainly the
24 locator did take into account the future possible
25 expansion of those northern communities.

26 Q Is it a policy of
27 trunk services like pipelines not generally to go
28 through small communities in Canada; but to go
29 outside them?

30 A I am sure that there

1 are exceptions, but I would say, yes, that would
2 be the general rule of a locator unless he had
3 a specific reason to take a line to a community
4 for distribution of gas or so forth.

5 Q Is this a safety
6 factor?

7 A That is part of it and
8 part of it is inconvenience, for instance, if
9 you have a pipeline in an area that is subdivided into
10 small lots it is an inconvenience for future
11 development.

12 Q All right, were
13 the people of the small communities up the
14 Mackenzie Valley consulted as to whether they
15 wanted the pipeline, for example, to go right
16 through their community or right through their
17 adjacent area before the prime route was selected,
18 to your knowledge?

19 A I do not think so,
20 sir.

21 THE COMMISSIONER: You
22 mentioned somebody called the locator to Arctic
23 Gas -- there is nobody employed called the locator,
24 -- that is just a --

25 A No, certainly, there
26 were -- the selection of the final prime route had
27 input from many people. When I am speaking of the
28 locator I am speaking of people like Dave Watson and
29 myself who sit down with stereo pairs along with
30 Jack Mollard terrain typing and select a route taking

1 into account as many factors as we can think
2 of.

3 THE COMMISSIONER: Well, then
4 it was -- you and your colleagues in Northern
5 Engineering together with Dr. Mollard who
6 made the selection of the route subject only to
7 Arctic Gas approving it?

8 A Yes, and the prior
9 work that had been done by Arctic Gas before
10 merger.

11 Q When there were two
12 consortia?

13 A Yes, I should have
14 said Gas Arctic Systems.

15 MR. BAYLY:

16 Q Now, you referred in
17 your evidence in chief as a panel, to the route
18 originally being on the west side of the Mackenzie
19 River prior to its relocation, some time perhaps in
20 1972 or '71, onto the east side of the river and in
21 the application again, volume 8 at 8 (a) i, page
22 5, at the first full paragraph, the sentence I
23 will read is that "The east side of the Mackenzie
24 River was ultimately selected as the prime route in
25 light of the fact that the Government had selected
26 that side for its highway" and the sentence goes on,
27 but I will not.

28 The decision appears to have
29 been based at least partially on the location of
30 the highway on the east side of the river. Do you

1 as a panel know of any other reasons why the east
2 side is preferable to the west side?

3 WITNESS MOLLARD:

4 A Well, there is a
5 difference in the character of the streams on the
6 east side and the west side for one thing. They
7 are much more shifting I think on the west side,
8 gravel bed streams with low banks and subject to
9 more variation because there are several large
10 lakes on the east side such as the Great Bear
11 lake and Black Water Lake and Fish Lake and Willow
12 Lake and so on, so that is one factor --

13 Q All right, would it
14 be fair to say that you were attempting to avoid
15 crossing streams like the Keele, which is a braided
16 channel stream which does not come from a large
17 lake but comes out of a mountain system?

18 A Well, that is a braded
19 river, certainly, but I just pointed out that that is
20 typical of the character of several of the streams
21 on the west side which have that habit of braiding
22 and shifting which is not quite the same on the
23 east side.

24 Q And you say that there
25 are more of them then on the west side than on the
26 east side, is that correct?

27 A Yes, I would say
28 so.

29 Q And do they present
30 engineering difficulties that make engineers prefer

Dau, Williams
Mollard, Watson
Cross-Exam by Bayly

1958

1 not to cross them as opposed to other streams?

2 A Well, I have considered
3 these in past studies. There is a whole panel
4 coming up dealing with that very problem and I think
5 I defer to them to answer that question.

6 Q All right, I do not
7 wish to get into it except as far as route selection
8 is concerned and having read over some of your
9 material, Dr. Mollard, I wanted to take this
10 of
11 opportunity/having you here of asking if that would
12 be a reason for selecting as a prime route an
13 area that did not have a large number of this
14 sort of streams, if you had a choice.

15 A Yes, yes, -- other things
16 being equal I think you would accept the rivers with
17 the less shifting rate of habit, in my view.

18 Q All right. Now --
19 THE COMMISSIONER: On the
20 east side?

21 A That is right.
22 But there again, of course, that is only one, I
23 suspect of many considerations, so I do not want
24 to draw -- want persons to draw conclusions from
25 that one example.

26 MR. BAYLY:

27 Q All right, the appli-
28 cation does refer to other things about the
29 east side as opposed to the west side, I believe
30 and it gives examples of game and I will not
get into that with you because that is not your

Dau, Williams
Mollard, Watson
Cross-Exam by Bayly

1959

1 field.

2 Now, can you give me a date
3 as to when the main focus of research shifted from the
4 west to the east side of the river as a prime route?
5 I do not necessarily mean a day, but perhaps a year
6 and a month.

7 WITNESS WILLIAMS:

8 A With respect to -- at
9 that time Williams Brothers Canada Limited and its
10 relation to the Northwest Projects Study Group, that
11 emphasis shifted in early 1972.
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Dau, Williams, Mollard, Watson
Cross-Exam by Bayly

1 Q Now, is it true that
2 prior to 1971 and '72 there was very little information
3 on the soil and permafrost on the east side of the
4 Mackenzie River?

5 WITNESS MOLLARD:
6 A Prior to what date?

7 Q This decision to make the
8 route change in early 1972.

9 A You're asking, was the
10 volume of information that was known roughly the same
11 at that time, or was it quite different, is that the
12 question?

13 Q Yes.

14 A I would say at that time
15 they were roughly the same, as far as I was concerned.
16 Probably slightly more drilling being done, on the east
17 side maybe than on the west side.

18 Q All right.

19 A I'm not sure of the number
20 of holes, of course.

21 Q All right, if I could
22 refer you, Dr. Mollard, then to a document which this
23 panel relies on, which is No. 176 in your resume of
24 documents, and I believe I've put my learned friend
25 on notice and he's got a copy of that, it's called,
26 "Evaluation of major river crossing sites,"
27 and it was a document published by Hardy & Associates
28 in August, 1972. Is the panel familiar with this report?

29 WITNESS DAU: It will probably
30 be dealt with in the next panel.

Q Now, I realize we have

Dau, Williams, Mollard, Watson
Cross-Exam by Bayly

1 this problem with panels, Mr. Commissioner, and I
2 only want to discuss this with regard to route selec-
3 tion. I don't want to get into the actual individual
4 --

5 THE COMMISSIONER: The condi-
6 tion of the rivers, you don't want to get into that,
7 I understand. Carry on.

8 A. Would you repeat the title
9 of that document, please?

10 MR. BAYLY: The document is
11 entitled:

12 "Evaluation of major river crossing sites,"
13 and there's a capital "GA" and oblique stroke, "NPSG
14 Gas pipeline project," and it's under the documents
15 listed in the name of Hardy, R.N. & Associates Limited.

16 MR. SCOTT: It's to be observed,
17 Mr. Commissioner, that my friend is reading from a
18 list of documents that this panel prepared on which
19 they indicated reliance in the evidence they were
20 giving today.

21 MR. GENEST: I don't want to
22 quibble, but --

23 MR. BAYLY: I don't know if
24 they rely on it, Mr. Commissioner, but I'm going to
25 ask them to refer to it.

26 MR. GENEST: We seem to have
27 a problem.

28 MR. BAYLY: Somebody borrowed
29 that document?

30 MR. GENEST: No, we didn't

Dau, Williams, Mollard, Watson
Cross-Exam by Bayly

1 get the right document. Is it No 176?

2 MR. BAYLY: 176 and 177, which
3 I will be referring to later. I am quite happy to go
4 on, Mr. Commissioner, to another question.

5 MR. GENEST: Why don't we get
6 that?

7 MR. BAYLY: I'm sorry, it may
8 have been my fault for not listing that one, but I
9 believe I put it on the list.

10 MR. GENEST: We'll send someone
11 to get it.

12 MR. BAYLY: All right, I'm
13 going to suggest to you, and we can confirm this, I
14 believe, in that report, at page 5, the comment that
15 there is very little information on soil and permafrost
16 conditions in the actual river valleys, and that is
17 at the date that report was prepared. I would like
18 a comment from you on whether you feel that there is
19 now enough information to select the east side as the
20 prime route, if in fact it was correct that there
21 was very little information at that time? It's a
22 double question: Do you agree, first of all, that there
23 was very little information at that time?

24 A On the west side?

25 Q No, this is on the
26 east side.

27 A Well, relative to now,
28 yes.

29 Q All right, could you
30 give us some idea of the volume of information that

Dau, Williams, Mollard, Watson
C ross-Exam by Bayly

1 there now is in comparison with that stage when there
2 was still some debate as to which side would be
3 appropriate for the prime route?

4 A Well, it's my recollection
5 that -- if I'm right -- that there was a higher density
6 of holes perhaps even at that stage on the east side
7 because the Mackenzie Valley Pipeline went down -- that's
8 the warm oil line -- went down the east side and the
9 chilled gas at that time, I believe, went down the west
10 side. If I were to guess as to the density of test
11 holes at that time, I would have to think that there were
12 probably more on the Mackenzie Valley warm oil side
13 than on the other.

14 Q All right, now if I were
15 to suggest to you that Mr. Hardy says in his report
16 not with regard to test holes but with regard to aerial
17 data on rivers to be crossed, that there was very
18 little information and that a lot of work would have
19 to be done, would you agree with that?

20 A Well, I'm not a river
21 engineer, but -- and I'm not sure of the total amount
22 of hydrologic data or hydraulic data that they would
23 want, but I'm sure if they felt that it was inadequate
24 in my view I'm sure it was.

25 Q All right.

26 A And when I say the
27 difference, I don't mean to suggest that good hydraulic
28 engineers couldn't handle problems on both sides of
29 the river.

30 Q Now, you have identified

Dau, Williams, Mollard, Watson
Cross-Exam by Bayly

1 though that -- and we'll be talking about this more
2 specifically, I'm sure, with the geotechnical panel
3 -- that there are certain problems with rivers on the
4 west side that don't occur at least in number on the
5 east side to the same extent, is that correct?

6 A Yes I think -- well,
7 problems
8 they're different in my view, and I think that probably
9 again that that's something that they'd be better
10 qualified to answer than me.

10 Q All right.

11 A But I did make the note
12 that I see generally different physiography on both
13 sides of the river and I think probably different run-
14 off periods.

15 Q All right, now if I were
16 to compare say a river on the west side of the Mackenzie
17 like the Keele, to some of the rivers being crossed
18 on the north slope of the Yukon on the prime route,
19 would you say that there are similarities in that they
20 are braided channel streams coming out of mountains?

21 A Yes, there are simil-
22 arities.

23 Q Do they present the same
24 kind of engineering problems?

25 A I would say somewhat
26 similar, subject to better information from my colleagues.

27 Q Mr. Dau, I see you're
28 getting ready, perhaps you have some information on
29 it.

30 WITNESS DAU: No sir, I think

Dau, Williams, Mollard, Watson
Cross-Exam by Bayly

1 that type of a detail in comparing rivers is much
2 better handled by the next panel.

3 Q All right, let me ask
4 you the question then in a general way, when you're
5 selecting a prime route were you in consultation with
6 hydrological engineers who made comments about the
7 relative difficulties of crossing braided channel
8 streams?

9 A Yes.

10 Q And did they appear to
11 express some concern with regard to braided channels
12 as opposed to other kinds of streams?

13 A I can't recall that as
14 a specific concern. This took place over a long
15 period of time, with many consultations.

16 Q All right.

17 A Many discussions, and --

18 Q Can I get a rise out
19 of anybody else on the panel for that question?

20 WITNESS MOLLARD: In my
21 mind there were different streams with different
22 problems and they're handled in different ways and
23 they can be handled competently by experienced people,
24 in river engineering, and I can suggest that in
25 my view there are certain features of the river that
26 I see on one side that I don't see on the other,
27 and I would just assume that a person that was competent
28 in that field would be able to tackle that problem when
29 he had adequate data.

30 Q All right. Now, is there

Dau, Williams, Mollard, Watson
Cross-Exam by Bayly

1 -- going back just a step beyond --

2 MR. GENEST: Mr. Williams
3 wanted to speak.

4 MR. BAYLY: I'm sorry, Mr.
5 Williams.

6 WITNESS WILLIAMS: If you
7 were looking for opinions from a location engineer,
8 my opinion is that the rivers on the west side -- the
9 tributary rivers on the west side of the Mackenzie
10 River are much more difficult to cross than the
11 tributary streams on the east side, but they are
12 different problems to the braided rivers on the Arctic
13 coastal plain, the banks of the rivers on the west side
14 of the Mackenzie are much higher and in my opinion can
15 be more serious stability problems than the shallower
16 bank crossings on the Arctic coastal plain.

17 Q All right, I take it
18 then that --

19 WITNESS MOLLARD: I take it
20 then for what it's worth I would share those views.

21 Q All right.

22 MR. GENEST: Back to your
23 report now, Mr. Bayly.

24 MR. BAYLY: Yes.

25 Q If I can go back then to
26 the Hardy report, No. 176, if you just look at page
27 5 and the comments, I don't have the line reference
28 but it's fairly low down on the page, it discusses the
29 amount of information, and if you can find it there
30 in the report perhaps you can read it.

Dau, Williams, Mollard, Watson
Cross-Exam by Bayly

WITNESS DAU: If the sentence

you're looking for is,

"However, there is very little information on
the soil and permafrost conditions at the
actual river valleys,"

Q That's correct, and I
take it from what Dr. Mollard says that this has
changed dramatically since that report was written,
is that correct, Dr. Mollard?

WITNESS MOLLARD: On the east
side?

Q That's correct, yes.

A Well, there's a great
deal more information, as I mentioned yesterday or the
day before. I think I said there was something like
8,500 holes, but it's my understanding that the so-
called site specific information, detailed information
on the stream crossing and so on, that's for a future
stage.

Q All right.

WITNESS WILLIAMS: That
report is dated 1972, and Northern Engineering and
their consultants have done considerably more drilling
at the major river crossings, which this report is
on, since that date.

Q Yes, and this was what
I was looking for, to know just whether you feel that
you're more confident now than Mr. Hardy was then
about the amount of information?

A I think that's fair, but

Dau, Williams, Mollard, Watson
Cross-Exam by Bayly

1 I think we can also say that we're not going to suggest
2 that more examination is required.

3 Q All right, is this an
4 area of shifting permafrost with the permafrost line
5 change on the east side of the river?

6 WITNESS MOLLARD: In what
7 respect, shifting?

8 Q Are there areas of
9 intermittent permafrost and areas where the permafrost
10 migrates on the east side?

11 A Well, the east side has
12 discontinuous permafrost in it, which means that there
13 are holes, you might say, in the permafrost, where
14 the ground ice is thawed out, and there's a broad
15 belt of discontinuous permafrost starting up somewhere
16 north of Rrt Good Hope and going down.

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1 Q All right, and
2 would you contemplate then even though this is
3 the prime route selected that you would have to
4 do a step by step analysis before putting anything
5 into the ground because of this discontinuous perma-
6 frost zones?

7 A Well, as Mr. Williams
8 stated, I think more information is desired and
9 would be forthcoming before he would do that.

10 Q All right. How
11 long does something like that take, Mr. Williams?
12 Can you give us an engineering forecast of how
13 much time would be required to plot out a route like
14 this in this kind of terrain?

15 MR. GENEST: Would my friend
16 help us by what he means by plot out a route?

17 MR. BAYLY: As I understand
18 it, Mr. Commissioner, the answer to the last question
19 was "we are not at the stage yet where enough work
20 has been done to go ahead and put pipe into the
21 ground." I was asking Mr. Williams therefore how
22 much time would be needed to do the various studies
23 and I think this reflects on the choice of a route.

24 WITNESS WILLIAMS:

25 A Let me say that in our
26 opinion the pipeline can be built on the route that
27 is shown in the application and the additional work
28 that we are proposing to do will be an improvement
29 in that location. It will result in an improvement
30 in that location and that work can be done in the

1 time frame of the schedule that we
2 have exhibited in the application.

3 Q All right. Now,
4 referring to Dr. Mollard's comment with regard to the
5 engineering possibilities of crossing braided
6 channel streams, I would ask you, Dr. Mollard, are
7 you acquainted with the unique study on streams
8 that was done by the Environment Protection Board
9 on the prime route proposal?

10 WITNESS MOLLARD:

11 A No, I have not seen that
12 report.

13 Q If I might refer then
14 to some excerpts from that report and perhaps have
15 your comments on them as a professional. I am
16 referring, Mr. Commissioner to the Environmental
17 Impact Assessment which is volume 4 to the Research
18 Reports of the Environment Protection Board at
19 page 177.

20 Now, I know that we have
21 some difficulty with number of copies of that
22 in the room today and Mr. Marshall informed me that
23 their copy has not arrived yet from --

24 MR. MARSHALL: I believe
25 that we do have a copy.

26 MR. BAYLY: You do have a
27 copy.

28 A Could you summarize
29 it -- maybe I could listen.

30 Q All right. If I

1 might read you the abstract and then refer to certain
2 parts of it. The abstract will give you an idea
3 of the scope of the paper.

4 The abstract is at page
5 177 and reads as follows:

6 "A hydrological analysis of climatological,
7 topographical and geological data was used
8 to estimate flood frequencies and suspended
9 sediment concentrations before and after
10 construction and to classify all streams
11 according to their hydrological behaviour.
12 Qualitative descriptions of stream behaviour
13 including the potential for winter aquatic
14 habitat in streams were also developed.
15 It was found that the greatest potential
16 for measurable increase in suspended
17 sediment concentrations is on the few small
18 steep watersheds having a large fraction
19 of the drainage area disrupted by air
20 strips, quarries and compressor stations in
21 addition to road and pipeline rights-of-way.
22 The greatest potential for major interference
23 with natural stream processes is on the
24 Yukon coast where large in-stream gravel
25 borrow operations have been suggested by
26 the applicant. Unless the quantities of
27 gravel to be removed are a small
28 fraction of the annual volume transported
29 by the source stream, such operation
30 should be avoided."

1 And that is the abstract
2 of the paper, perhaps you would like to comment on
3 the abstract before I go into certain specific things
4 that arise out of it.

5 A Well, my mind is fairly
6 small. I am not sure that I can retain all -- every-
7 thing that you read, but --

8 Q I believe that you
9 have a copy beside you.

10 A Well, I will just
11 try and then you can correct me.

12 In answer to that the thing
13 that sticks in my mind is the last comment about
14 excavating material in the gravel bed -- and we have
15 certainly done lots of gravel work, but not of that
16 character in stream beds in the north, but to my
17 knowledge at Prudhoe Bay, the Sagavaninktok they have
18 been taking gravel out of the bed there for some time
19 and fish studies have been done, and so I do not
20 know the results of that study, but that information
21 I suspect would be relevant.

22 Q All right, you know
23 that they have been borrowing but that is as far as
24 your knowledge goes --

25 A Well, I know that they
26 have been borrowing from the stream bed and my recollection
27 is that it was not unduly serious, but I cannot prove
28 that -- that may be from conversations that I have
29 had with contractors that have been up there, it may
30 be biased, I do not know.

1 Q All right.

2 A And I know that Peter
3 McCart did studies of fish in that river.

4 Q Yes, so you would
5 not be able to comment then on the general statement
6 that gravel borrow should be of a certain proportion
7 of the carrying amount of the stream to avoid damage
8 at this stage anyway?

9 A No, I do not really
10 think so -- I might comment, but I might have doubts
11 about it later on.

12 Q All right. Now, one
13 of the comments in this report and I am referring
14 again to page 177 and this I believe relates to route
15 selection and the planning therefore, is this and I
16 am reading from the second paragraph in the introduc-
17 tion:

18 "However most of the stream...."

19 I am sorry, let me go back to the beginning of the
20 paragraph to give you the context. -- and I believe
21 that you have the report there in front of you.

22 "If adequate stream flow data were available
23 it would have been summarized in some
24 convenient form directly from the records,
25 however most of the streams crossed by
26 the pipeline have never been gauged.

27 In the absence of such data a theoretical
28 approach was taken to describe the physical
29 settings of bodies of water influenced by
30 the pipeline."

1 Now, this report is dated
2 1974 and I am wondering if streams in the prime route
3 have been gauged since.

4 A I am not aware of
5 it. I think maybe the Department of the Environment
6 may have done some work and I know that Dr. McDonald
7 is up there doing work on the north slope streams a
8 but I cannot say whether they did any metering of
9 the stream flows on those, I just do not know the
10 answer to that.

11 Q All right, now when the
12 prime route was selected and perhaps I should transfer
13 my question now to Mr. Dau, was there any information
14 on gauged flow of the majority of the streams to
15 be crossed by the prime route?

16 WITNESS DAU:

17 A Certainly not a majority
18 of the streams, no.

19 Q All right.
20 Now, what proportion --
21 do you have any information on what proportion had
22 been gauged?

23 A I do not. It would
24 be very small I am sure.

25 Q All right.
26 MR. GENEST: Mr. Bayly,
27 perhaps, I have just got a note that we do --
28 apparently have discovered a report on the
29 Aleyska gravel borrow operations and it is in
30 the mail apparently.

1 MR. BAYLY: Is that like
2 suspended sediment?

3 MR. GENEST: That is
4 right. So we will let you have it if that is
5 the expression.-- as soon as it arrives.

6 MR. BAYLY: All right.

7 Q I would like to
8 continue nonetheless on some of the questions while
9 I have the advantage of Dr. Mollard and the rest
10 of the panel here, Mr. Commissioner. I will
11 be coming back to this report, but in this line
12 of questioning I have raised the questions of
13 gravel deposits. Now, perhaps you could
14 comment, Dr. Mollard and Mr. Williams as well,
15 is the location of gravel deposits close to the
16 pipeline route a determining factor in route
17 selection?

18 WITNESS MOLLARD:

19 A Yes, I would
20 say it is one -- it is hard to say just to what
21 extent because that is a matter of many factors,
22 economics and so on, but certainly the ideal thing
23 would be to have a pile of gravel appropriately
24 distributed along the route just where you wanted
25 it -- but nature is not that kind --

26 Q And I believe that
27 you have commented in the report on just how unkind
28 nature is in some areas of the prime route with
29 regard to gravel and if I might refer to your
30 report, Dr. Mollard, number 270 on the list that has

1 been given to us for this panel called "Gravel and
2 Bedrock Borrow Prospects -- Physiographic
3 Division 16 (Elliot Creek to Richards Island and
4 Travaillant Lake to the Northwest Territories/Yukon
5 Border) from November 1972"--

6 A Yes, I vaguely recall
7 that -- we were doing gravel searches weekly, but I
8 can recall a number of the deposits in there and
9 their relative size and approximate distribution, but --
10 there are over a hundred probably.

11 Q Is one of the gravel
12 deposit areas that you recommended as being a prime
13 source in that report located near Travaillant
14 Lake?

15 A There are a number as
16 I recall and I have to go back by memory. And my
17 memory would say that -- Yes, it is here, but I can
18 remember -- it will just confuse me --

19 Q It is on page three,
20 Dr. Mollard -- in case I can confuse you further --

21 A Yes, for example if you
22 take Travaillant Lake in its broadest, you know,
23 context of an area and I have not really looked at
24 the report this morning -- there are a number of
25 fairly large deposits which I think are substantial
26 such as North of Hans Creek and then there is a
27 large Meltwater channel about eight miles northeast
28 of Little Chicago which I think probably has
29 15 million cubic yards in it and then there are
30 large deposits if I remember correctly at Sunny Lake

Dau, Williams
Mollard, Watson
Cross=Exam by Bayly

1 and another lake which starts with an "s" I
2 forget the name of the lake and Big Stone Lake.
3 There is another deposit in there, quite substantial
4 and those are in the vicinity of Travaillant Lake
5 and I think if I remember correctly there is a fairly
6 substantial deposit somewhat south and east --
7 not too far from Travaillant Lake -- so -- those
8 in my view are quite substantial deposits, in the order
9 of possibly ten million cubic yards or more.
10 That is an estimate without a great deal of drilling
11 I would assume you would have to do some drilling,
12 but I sort of classify them in terms of ones that I
13 can remember which are large and look good versus
14 dozens which are very marginal and sort of doubtful.

15 Q Now, I know from Mr.
16 Marshall that we will be having another witness who
17 will be talking about the specifics of gravel borrowing
18 and I am not going to go into the specifics --

19 A Yes --

20 Q But with regard to this
21 area, the Richards Island area and the Travaillant
22 Lake are --

23 A Yes --

24 Q In your opinion if the
25 route chosen by Arctic Gas were to be the cross-
26 delta proposal, would the gravel on the east --
27 southeast side of Travaillant Lake be required and
28 especially so in the light of the fact that there
29 is a producer application for various installations
30 which I assume will also use gravel.

Dau, Williams, Mollard, Watson
Cross Exam. by Bayly

1 WITNESS MOLLARD:

2 A Well, I'm not sure I have the
3 question, so let me rephrase it and you can say, yes or
4 no. You're saying that if the route went across the
5 delta, and down the east side, let's say to Fort Good
6 Hope, in that route, is there fairly substantial deposits
7 of gravel along that particular route, and are there
8 any segments that I might recall where they're fewer?
9 Is the sort of question?

10 Q Yes.

11 A Yes, well there are a number
12 of very major deposits on Richards Island, the
13 Yayaesker being a classic, and the number of nearby
14 deposits within a mile or two. And on the south side
15 of the river there's, across from Swimming Point, there's
16 a wash deposit there at least ten feet deep and fist-
17 sized material. And then on Caribou Mountain, or
18 Caribou Hills, there's a gravel face which is exposed
19 about three hundred feet high and runs several miles
20 in length, which is a tertiary gravel, which is older
21 than glaciation, several tens of millions perhaps years
22 old. And from there to Parsons Lake, the situation,
23 in my view is pretty good. There are a number of sources
24 fairly large. And then from there south, I think there's
25 one southeast of Knoll Lake and then it's pretty skinny,
26 from there to south of the Campbell Lake depression,
27 and I'm told that the deposit at Inuvik which has been
28 worked for years, is just about exhausted, but then
29 there are rather large bedrock deposits there of varying
30 types, carbonic rocks like limestone and so on which are

Dau, Williams, Mollard, Watson
Cross Exam. by Bayly

1 used. But really from several miles south of Parsons
2 Lake to just south of Campbell Lake, it would be what
3 I would consider an area where there are relatively
4 few, there are, I might use the expression, piddly,
5 small deposits, which no self-respecting contractor
6 would go into, but they exist. But then when you get
7 south of the Campbell Lake depression. there are a
8 greater number and they tend to be, I shouldn't say
9 inland, maybe to the east rather than to the west of
10 the line, and several of those no doubt are huge deposits.

11 Q Well, in this area where it's
12 "skimpy" I believe is the term you used, is this the
13 area you referred to on page three of that report
14 where you say that there will be long dead haul distances
15 to the pipeline route, and long travel distances along
16 that route?

17 A Yes, there would be depending
18 upon possibly the location of near surface shales that
19 might be used for certain purposes, but which would be
20 of course, ^{totally}unsuitable for concrete and that kind of
21 aggregate. But there are places within that stretch
22 that I mentioned where this rather poor quality bedrock
23 might be used for certain rather, purposes that have
24 a low standard requirement.

25 Q All right, now this gravel--
26 Dr. Mollard, this gravel deposit east of Travaillant
27 Lake interests me. Do you know of your own knowledge
28 or does any of the panel know, whether this is located
29 in what has been identified by Arctic Gas and others,
30 as an ecologically fragile area?

Dau, Williams, Mollard, Watson
Cross Exam. by Bayly

1 A I can't answer that, because
2 I don't know the ecologically fragile areas.

3 Q Perhaps Mr. Dau, you have a
4 comment on that?

5 WITNESS DAU:

6 A The gravel source that Dr.
7 Mollard was referring to, east of Travaillant Lake?

8 Q I believe to the southeast
9 he said there was a large deposit?

10 WITNESS MOLLARD:

11 A Yes, the one that you are
12 referring to is the one to which I am referring to,
13 which is one of two or three in there that are fairly
14 substantial, but that one--

15 Q Are they all in the east?

16 A Yes, well, north and northeast
17 and southeast, I would say.

18 Q All right.

19 WITNESS DAU:

20 A I'm sorry, I can't respond to
21 your question, I do not know.

22 WITNESS MOLLARD:

23 A If I knew where the boundary
24 of the ecologically sensitive area was to the east, I
25 might be able to give an answer to it.

26 Q Now, if I can go on to the
27 application. There is a comment made about this
28 ecologically sensitive area. And I am referring now to
29 Volume 8, Exhibit 54, it is 8 A 1, page 6, and it is the
30 paragraph
fourth down. Do you have that in front of you Mr. Dau?

1 WITNESS DAU:

2 A Yes.

3 Q Now, if I might draw your
4 attention to that? If I go into the middle of the
5 paragraph, and start with the sentence "the Travaillant
6 Lake area of the Northwest Territories provides an
7 astounding example" and I believe that is of a route
8 change which was made on other than engineering grounds?

9 A That's correct.

10 Q "As a result of information
11 and recommendations furnished by the environmental
12 consultants, a need to change the routing to the east
13 or west was found to exist. The Prime Route was moved
14 approximately twenty miles west of the original routing
15 resulting in a change in total pipeline miles and total
16 horsepower requirement. These changes were made to
17 avoid a highly productive area for mammals, fish and
18 birds." Now the question I am asking of this panel is,
19 whether or not you know what the boundaries of that
20 area as defined by your consultants is, and whether
21 this gravel site or the three that Dr. Mollard has
22 identified, are within that?

23 WITNESS WATSON:

24 A This can be answered very
25 specifically I think by the next panel, but to the best
26 of my knowledge the environmentally sensitive area that
27 is referred to in the Exhibit 8, is an area that extends
28 to, mostly to the west and north of Travaillant Lake.
29 And I believe the gravel source that you are discussing
30 is to the east of Travaillant Lake. Is that right?

dau, Williams, Mollard, Watson
Cross Exam. by Bayly

1 WITNESS MOLLARD:

2 A Yes, it is. In general it is
3 my recollection that to the north and to the west of
4 Travaillant Lake, the sand and gravel deposits become
5 smaller and less desirable in general.

6 Q All right. Now, tell me then
7 where the route was changed from originally if you could?
8 Perhaps somebody could refer to that on a map?

9 WITNESS WATSON:

10 A If you can bear with me for a
11 moment. I have a set of maps here that has that change
12 on it.

13 WITNESS MOLLARD:

14 A I might say -- am I on here?
15 I was just going to say Mr. Bayly, that I just noticed
16 my notes here, and I've written a note to myself, saying
17 "be brief", and I'm afraid I haven't followed that
18 injunction to a tittle at least, but I will try to cut
19 down a little bit maybe.

20 MR. BAYLY: Your counsel may be
21 it
22 worried about Dr. Mollard, but I'm not.

23 (LAUGHTER)

24 THE COMMISSIONER: While those maps
25 are being looked for, Miss Hutchinson, has the first
26 amendment to the application been marked as an exhibit?
27 If it hasn't it should be marked to whatever exhibit
28 number "A" the application itself was given. What was
29 the exhibit number of the application Miss Hutchinson?

30 MR. GENEST: It was three, sir.

Dau, Williams, Mollard, Watson
Cross Exam. by Bayly

1 THE COMMISSIONER: Three? Well, then
2 the first amendment should be marked "Three A".

3 MR. GENEST: It was marked 65, I
4 believe sir.

5 MR. SCOTT: I suggest Mr.
6 Commissioner, that we simply mark the exhibits as they
7 come in, in numerical order, and try and sort it out
8 later.

9 MR. BAYLY: I wonder if that map
10 could possibly be projected with this projection? Does
11 that work?

12 MR. GENEST: It has to be on
13 transparent paper.

14 MR. BAYLY: Oh I see, perhaps
15 you could then--

16 MR. GENEST: Perhaps he could
17 indicate it over on the wall?

18 MR. BAYLY: Yes, or perhaps you
19 could describe it on that map, and show it to the
20 Commissioner at least?

21 WITNESS WATSON:

22 A I shall attempt to point it
23 out on the wall.

24 MR. BAYLY: If that is possible,
25 yes, but it is a very small map from where I'm standing.
26 I mean it's hard to see.

27 THE COMMISSIONER: Well, why don't
28 you just carry on from there, Dr. Watson--

29 WITNESS WATSON:

30 I can attempt to point out the

1 routing
original/on the wall map.

2 MR. BAYLY:

3 Q If you would as best you could
4 please, Mr. Watson?

5 A The pipeline route that we were
6 following prior to--

7 Q Could you repeat that please
8 Mr. Watson, I don't think you were on?

9 A It doesn't seem to be working.

10 Q Maybe Mr. Marshall can plug
11 you in?

12 MR. MARSHALL: We need an
13 electrician.

14 MR. BAYLY: Perhaps you could
15 just speak up Mr. Watson?

16 WITNESS WATSON:

17 A Can you hear me now?

18 Q Yes.

19 A The pipeline route prior to
meetings
20 the April '73 environmental/-- this is our present
21 junction at Travaillant Lake.

22 Q You're indicating a point on
23 the map then about an inch and a half from the corner
24 of Travaillant Lake, the--

25 A I'm indicating my present
26 route as filed now, the routing as filed from Richards
27 Island, as I follow it down to Travaillant Lake
28 junction. The routing prior to the April '73
29 environmental meetings had a junction point approximately
30 where I'm indicating here, and about halfway between

1 our present junction point and Travaillant Lake. The
2 Richards Island routing follows the same route from
3 Richards Island down to a point in the vicinity of
4 Inuvik. The route at that time ran west, pardon me,
5 east, it ran east of our filed route, in more or less
6 a straight line down to this junction point that I've
7 indicated here. The routing/west of Travaillant Lake
8 was a route change at the Mackenzie river/ of Arctic
9 REd. Our present route as filed is approximately two
10 miles upstream, or downstream pardon me, from our
11 original routing. In other words, the original routing
12 passes south of the routing you see on the map.
13 Now, from a point about here, the two routes were
14 basically similar over to this junction point.

15 Q All right, could you point
16 out Mr. Watson, for the benefit of us all, on that
17 map, Travaillant Lake?

18 A That is this lake.

19 Q All right, now, there is a
20 black line which runs down to the east of that lake,
21 and am I correct in saying that that is the Cross-
22 Delta proposed route?

23 A That is correct.

24 Q So the Cross Delta Route has
25 moved now to the east side of Travaillant Lake?

26 A That's correct.

27 Q Do you know of your own know-
28 ledge whether that it withir the area that has been
29 described as ecologically fragile?
30

Dau, Williams, Mollard, Watson
Cross Exam. by Bayly

1 A To the best of my knowledge,
2 and I emphasize again, this can be answered very
3 specifically by the next panel, but to the best of my
4 knowledge, the environmentally sensitive areas tend to
5 be north and west of Travaillant Lake in this area of
6 lakes here, and I do not think it extends in the area
7 of the Cross-Delta Route.

8 Q All right, I'll go into that
9 with the next -- I don't think it is the next panel,
10 but whatever panel it is which is going to deal with
11 that. I can't imagine a geo-technical panel discussing
12 that.

13 Now, going back to Dr. Mollard,
14 perhaps you can tell me Doctor, with the projected use
15 of gravel for a project this size, would there be
16 enough used to effectively exhaust the deposits in
17 this area?

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Dau, Williams, Mollard, Watson
Cross-Exam by Bayly

1 Really in the Richards Islands
2 we're referring to Caribou Hills, Travaillant Lake, and
3 the Yaya Ester.

4 A No, in my wildest dreams
5 I can't imagine how you could possibly exhaust -- if
6 you're talking about the total available gravel -
7 sand and gravel resources, they're too huge.

8 Q All right, in your
9 opinion then could the applicant be selective and
10 ensure, if it were required to do so, that it didn't
11 borrow gravel, even if it were good gravel, from
12 ecologically fragile areas?

13 A Is it possible that he
14 could avoid them?

15 Q Yes.

16 A The numbers are such that
17 he could avoid them.

18 Q Yes, is there that
19 much gravel?

20 A Yes, there's certainly
21 that much gravel.

22 Q All right, can we add into
23 this mix then the producers and their gas well clusters
24 and their feeder lines and their processing plants,
25 would this in your opinion, put a strain on the resources
26 in the Travaillant Lake and Parsons Lake area?

27 A Well, of course I've got
28 a blind because I think of the producers being down
29 at Richards Island rather than the Travaillant Lake
30 as I know them now, exploring and producing.

Dau, Williams, Mollard, Watson
Cross-Exam by Bayly

1 So the area where the producers are now exploring
2 and likely, I suspect, to find material is in the
3 area where the greatest volume of available material is.

4 Q All right, and you don't
5 know of your own knowledge whether this is in what has
6 been described as ecologically fragile area?

7 A You're right.

8 Q Now, have you read, Dr.
9 Mollard, the comments of the Pipeline Application
10 Assessment Group on competing uses for gravel?

11 A No, I can't say that
12 I have.

13 Q Let me refer you to them
14 and perhaps your counsel has a copy of the Mackenzie
15 Valley Pipeline Assessment, which came out on November
16 '74. Perhaps Mr. Scott could give me something like
17 an exhibit number for them.

18 MR. SCOTT: 69.

19 MR. BAYLY: Exhibit 69, and
20 I'm referring to page 360, and there is a paragraph
21 and perhaps Mr. Dau can find it for you and it refers
22 to general supply of granular material .

23 A Could you read it aloud?

24 Q I will, yes.

25
26 "Also of concern is the cumulative effect of
27 use of borrow materials by pipeline, highway
28 and other large developments on the general
29 supply of granular resources within the transpor-
30 tation corridor. From available data, it is

Dau, Williams, Mollard, Watson
Cross-Exam by Bayly

1 apparent that there will be local shortages,
2 particularly of high-grade materials and that
3 prudent use of available resources (for
4 example, reservation of high-grade materials
5 for jobs needing them), is of importance.

6 Based upon the government's granular materials
7 survey, shortages are most likely to occur
8 in the following areas:

9 1. Mile 124 to 210 south and east of Travaillant
10 Lake."

11 It goes on to other areas but they aren't the ones
12 we've been discussing.

13 A That's right. I can't --
14 you see, it depends very much on how you define shortages
15 and in the future, is it half a mile? I look at it
16 as an engineer that's been mapping gravel for 20 years
17 and the user has to go to the source that's acceptable
18 in terms of quality and quantity, wherever Mother
19 Nature happens to place it, so in that context and
20 bearing in mind that you know, we'd like to have a
21 deposit, if it were possible, every so often, in the
22 right place, but in the overview, I think the deposit
23 at Fort Good Hope and Ping Creek and this large, large
24 deposit I'm referring to just north-east of Little
25 Chicago, and the several that we're talking about east
26 -- south-east and north-east of Travaillant Lake, if
27 they're not in these ecologically sensitive areas,
28 it's just a matter of dollars, you know, how you design
29 to get your material out -- the roads when you take
30 it out and so on. But in my view there is ample

Dau, Williams, Mollard, Watson
Cross-Exam by Bayly

1 material there. They are probably not quite as closely
2 spaced, if you had your druthers (and you never have
3 them), if you'd like to have them but I see no shortage,
4 plus, of course, those are granular deposits, they are
5 natural water-sorted materials, but there is also
6 bedrock in those areas if you extend it south as far
7 as I mentioned.

8 Q All right, now I take
9 it then that it is possible in some locations that
10 there would be competing uses for the gravel and that
11 the applicant would only be one of the competitors.

12 A I suspect --

13 Q But you think there's
14 enough to go around.

15 A Yes, and of course I
16 can hardly remember an area that I looked at in the
17 500-odd, where there aren't competing uses, you know.
18 Somebody thinks you should have a deposit, so it's
19 a matter of degree, so I don't think it's probably,
20 Mr. Bayly, that serious; but they are spaced depending
21 on how you want to plot out the distances as being
22 significant; they're fairly evenly spaced in there.

23 Q And on the north slope
24 of the Yukon would you envisage having to borrow from
25 the ^{braided} river streams in order to find adequate
26 gravel resources?

27 A That would be, of course,
28 environmental reasons aside, and all the other reasons
29 aside, my natural inclination would be to get the
30 gravel where it's obvious and where the river is a mile

1 wide and exposed and you know where it is and you can
2 see it, rather than -- because that's where the large
3 major deposits are. But I say environmental reasons
4 aside, because I don't want to comment on that field,
5 I don't feel I'm competent.

6 Q O.K.

7 A This doesn't mean that
8 bedrock sources at some distance couldn't be checked
9 too.

10 Q All right, I'd like to
11 refer back to that Environment Protection Board Report
12 that I've referred you to earlier, and a comment is
13 made in that report at page 202, and it is in what
14 is called the attachment, attachment 5 on river
15 channel stability, and it refers to borrowing gravel
16 from braided river channels. I'd like your comments
17 on it, if I could have them, please.

18 "On gravel borrow from streams,"
19 the report says in the first paragraph:

20 "Borrowing operations may be extensive involving
21 a mile or more of the river's length in some
22 cases, and will have noticeable effects on the
23 streams. The magnitude of the effects will
24 depend on the rate at which materials are
25 removed relative to the rate at which the stream
26 is supplying similar sediments to the borrow
27 area."

28 And it goes on on the next column, in the last paragraph
29 before No. 2,

30 "A shallow borrow will have the least effect

Dau, Williams, Mollard, Watson
Cross-Exam by Bayly

1 upstream because it will minimize the local
2 increase in gradient as the stream flows into
3 the borrow area, and because it presents the
4 least vertical displacement of the ultimate
5 upstream slope."

6 Now, would you agree that wherever possible shallow
7 borrows should be encouraged because they would have
8 the least effect on ~~braided~~ river channels and their
9 ability to replace without causing deep gullyng, their
10 original or at least a new convenient equilibrium?

11 A Yes, and you may be
12 forced to that because in some of the rivers the perma-
13 frost layer varies from two feet to 35 feet, and that
14 is the thawed layer, so that if it ^{were} two or three feet
15 down if you took that off you'd be on frozen ground,
16 even in braided channels, so that varies within the
17 river.

18 Q All right.

19 A And I don't know if
20 you asked me another question there or not.

21 Q But I just went that
22 far. I had another question to follow, and that was
23 this. In route selection then, would it be your
24 opinion that these rivers should be studied very
25 carefully to see whether they do provide the resources
26 without stripping off the active layer and getting
27 down into the frozen ground?

28 A Well, I certainly think
29 that they should be examined very carefully. I think
30 it would be in everybody's advantage.

Dau, Williams, Mollard, Watson
Cross-Exam by Bayly

1 Q All right.

2 A Including the people that
3 build the line, if it were to go ahead.

4 Q Now, when I say "examined"
5 I'm thinking in terms of route selection, and if I can
6 refer then to perhaps Mr. Dau, has this sort of examina-
7 tion been done prior to route selection, or is this
8 something that you would envisage taking place after
9 being granted an application?

10 WITNESS DAU: It would be a
11 matter of final design, in my view.

12 Q All right. Was it a
13 factor in any way, even at a more superficial level,
14 in selecting this as the prime route as say opposed
15 to the interior route ?

16 A A choice between the --

17 Q If given a choice between
18 the interior or coastal route, or one of the other
19 alternate corridors, is this something that was con-
20 sidered?

21 A No, I think not.

22 Q Now going on to other
23 requirements in selecting a route, is it true that
24 pipeline construction needs large quantities of water
25 and if I can give you a projected figure, approximately
26 1.3 million gallons per lineal mile? Let me refer
27 you to the report where I found that, that's listed
28 as document 58, not one that you have listed as a
29 document in your particular panel, I believe, although
30 I may be mistaken, but a report called:

Dau, Williams, Mollard, Watson
Cross-Exam by Bayly

1 "Water availability"

2 by T. Blanche & Associates.

3 A I have the document.

4 Q I was referring in that
5 to page 9 of that report, and just paraphrasing what
6 it says, that alternate routes may be partially deter-
7 mined by water availability, and going on, that in
8 some areas reservoirs, water pumping and trucking will
9 be required.

10 I'd like you to comment on
11 that as a factor in route selection and whether it
12 had anything to do in determining the route that was
13 selected as the prime route?

14 A It had very little in
15 -- very little to do with selecting the route. It
16 certainly was considered, you know, in the backs of
17 our minds, but it was not a prime consideration by
18 any means.

19 Q May I suggest that then
20 the problem was one similar to the one Dr. Mollard
21 raised that even if you have to go a long way to get
22 it, you can do it.

23 A That's right.

24 Q Is this route that is
25 the prime route, one that touches on sufficient water
26 in most areas, or have studies been done on that?

27 A There have been studies
28 done on it. There is the question 52 from the
29 Assessment Group, and the response deals with this
30 matter and refers specifically to two specific

Dau, Williams, Mollard, Watson
Cross-Exam by Bayly

1 construction spreads, one between Milepost 590 and
2 665 and the other is --

3 WITNESS WATSON: The mileage
4 of the other spread is from Milepost 195 to 254 on
5 the coastal route.

6 Q Could you read out that
7 question and response then?

Dau, Williams, Mollard, Watson
Cross-Exam by Bayly

1 A It's about ten pages.

2 Q Well, let's not do it.

3 We'll just all read it to ourselves later on as long
4 as we have the reference.

5 A It lists the requirements
6 for snow and ice roads, ^{ditch}/flooding, camp requirements,
7 and testing on a typical spread, by month, monthly
8 requirements. There's an estimate of the daily require-
9 ments and an estimate of the maximum daily withdrawal
10 rate. These two typical spreads provides quite a bit
11 of information and it's rather lengthy. It includes
12 maps and so on.

13 Q All right. Was my figure
14 of approximately 1.3 million gallons per lineal mile
15 --

16 A We very practically
17 put this in barrels.

18 Q How many gallons in a
19 barrel, Mr. Dau?

20 A 35.

21 Q 35?

22 WITNESS WATSON:
A I've done some quick
23 arithmetic on it and I believe that the requirements
24 that we show in Question 52 of the response is approxi-
25 mately half of what that 1.3 million gallons per
26 mile, this is based, I think, primarily on new designs
27 for ice and snow roads and re-estimation of the amount
28 of water that will be required for that.

29 Q All right so that the
30 figure that was in the Blanche Report was about twice

Dau, Williams, Mollard, Watson
Cross-Exam by Bayly

1 too high.

2 A Yes.

3 Q Now, you've stated in
4 your evidence in chief, as a panel, that the gas
5 pipeline can run on its own steam, on its own gas.
6 Sorry, you haven't, this was referred to in overview.
7 Is this correct, that you run on your own gas, you
8 power your compressor stations, etc. on your own gas?

9 WITNESS DAU:

A That's correct.

10 Q Do you envisage this pipe-
11 line as running entirely on its own gas?

12 A Yes.

13 Q All right. I notice in
14 the documents that you've referred to as relying on,
15 one of them is the Crippen Associates Report No. 130.

16 A Yes.

17 Q That's a report -- and
18 you can correct me if I'm wrong -- on hydro on the
19 Great Bear River, and it refers to the possible
20 building of two dams on that river.

21 A Yes.

22 Q Is that something that
23 has anything to do with Arctic Gas' prime route
24 selection?

25 A No.

26 Q Mr. Williams, you look
27 like you're about to say something.

28 WITNESS WILLIAMS: It did
29 give us a little bore hole data / near the crossing
30 of the Great Bear and showed the location of their

Dau, Williams, Mollard, Watson
Cross-Exam by Bayly

1 proposed dam, and we took that into account in selecting
2 the route.

3 Q All right, so it was
4 because of competing possible uses and because of data
5 that that report was included, is that correct?

6 A Land use, not power
7 use.

8 Q That's what I meant, yes,
9 land use. Now, you've referred to dual pipe crossing
10 major river crossings. Is the north slope and its
11 numerous rivers an area where you would be contemplating
12 crossing rivers with dual pipe?

13 A No.

14 Q And is the shallow bay
15 of the Mackenzie Delta an area which you would contem-
16 -plate crossing with dual pipe?

17 A Yes.

18 Q Assuming then you were
19 crossing the Firth, the Blow and the Malcolm and
20 associated river, with single pipe, you referred to
21 the difficulties of repair in say the Mackenzie River,
22 at breakup and presumably freezeup, I understand from
23 this then that you don't contemplate that kind of
24 difficulty along the north slope of the Yukon.

25 A That's correct.

26 Q Would there be some
27 difficulty at say, flood times?

28 A Yes, that's true, but
29 these rivers are much smaller than the Mackenzie.

30 Q All right. Now say you

Day, Williams, Mollard, Watson
Cross-Exam by Bayly

1 had to repair what you call a failure and I call a
2 break, are they the same thing?

3 A Yes.

4 Q All right, on one of
5 these north slope rivers, could you do so assuming it
6 was in the summertime without running vehicles all
7 over the terrain?

8 A It's a question and a
9 response -- give me a moment and I'll try and find it.
10 Yes, that is correct, question 22 and the response to
11 this question which deals with off-road vehicular
12 traffic required for contingency repairs. It's some
13 20 pages long.

14 Q All right, can you give
15 us your short answer to that, and we can all read the
16 long answer?

17 A Mr. Williams can
18 probably respond to this.

19 Q Passing the buck?

20 WITNESS WILLIAMS: The
21 response essentially says that yes, there will be some
22 terrain damage done if repairs are required in the
23 summertime, but we have the wherewithall in our opinion
24 to repair those -- that damage.

25 Q All right. If I could
26 suggest-- was it possible that you considered the
27 prime route in light of breaks that would occur, say
28 when the caribou were on that part of the coast, either
29 staying there or moving through, did that have any
30 effect on your response?

Dau, Williams, Mollard, Watson
Cross-Exam by Bayly

WITNESS DAU:

A No, it would not. We do
not expect to have any breaks.

Q I realize that, Mr. Dau,
but you have contemplated breaks as a remote possibility.

A That is correct.

Q So this was not then
considered, the possibility of saying have to do a
repair while the caribou were in the area.

A That was not considered,
no.

Q Would it in your opinion
make this a lesser than prime route if you realized
that this were a possibility and it might do some
damage to the caribou herd?

A Not in my opinion.

Q All right, and assuming
it happened when the geese were nesting, would your
answer be the same?

A It would have more
effect, this coastal route would have more effect if
a repair was necessary at the time the geese were
in the area.

Q Yes, or staging, sorry.

A Yes, staging area.

THE COMMISSIONER: What do
you have to do to carry out a repair if there is a
failure on the north coast? Let us suppose the
pipe were ruptured, what kind of equipment and how
large a crew would you have to bring in? Is there any
way of gaging that?

Dau, Williams, Mollard, Watson
Cross-Exam by Commissioner

1 WITNESS WILLIAMS: Those items
2 pretty well covered,
3 are, Mr. Commissioner, in the response to question 22.

4 Q Just go through it.

5 A It mentions in that
6 particular area fairly heavy reliance on^{an} air cushioned
7 vehicle. that would be -- that is shown in the appli-
8 cation to be in Inuvik. It talks about using helicopters
9 where possible, but certainly some of the heavier
10 equipment will have to be brought in by low ground
11 pressure bearing vehicles. I don't know if it
12 specifically deals with the number of people but I
13 can visualize upwards to 50 required to effect a
14 repair.

15 Q And for how long, for
16 how long would a crew of 50 and their equipment be
17 in the vicinity of let us say one of the rivers that
18 Mr. Bayly mentioned, should there be a rupture at such
19 a location?

20 A This is during the fall
21 season, is it, when we were worried about geese?

22 Q Well, take the fall or
23 any other season you wish, but start with the fall.

24 A At say the Malcolm River
25 a failure, in the hypothetical case --

26 Q Just so that I understand
27 where we're at, I take it the kill gas pipeline would
28 be buried under the bed of the river itself.

29 A Yes sir.

30 Q All right, now let us
assume that through activity of ice or some other

Dau, Williams, Mollard, Watson
Cross-Exam by Commissioner

1 cause, first of all in the spring, you had a break and
2 you had to go out and repair it. You say that you
3 would have a crew of maybe 50. How long would they be
4 there, given those spring conditions? I know you're
5 just guessing, and we can't expect you to do more
6 than that, but have you any idea?

7 A In the question 54, I
8 think it is, we dealt with repairs at river crossings
9 and that one we specifically chose the Great Bear River
10 as maybe being larger than what you suggest, except
11 possibly in the flood season, and there we talked about
12 in flood season of the possibility of putting in a
13 temporary line that I think we estimated could be done
14 in less than a week, and then go back in and do the
15 permanent repair at a more favorable time. I would
16 see the length of time being similar, say, with respect
17 to a failure on the Malcolm River.

18 Q What is it?

19 A Something less than a
20 week, seven days.

21 Q But what about the
22 effecting of repairs to the pipeline itself, I thought
23 you said you would put in a temporary pipeline within
24 a week, but then you'd return in a more favorable
25 season, which I take it would be the following winter --
26 correct me if I'm wrong --

27 A Yes sir.

28 Q That would be the
29 following winter, and how large a crew and for how long
30 would you need to effect a permanent repair?

Dau, Williams, Mollard, Watson
Cross-Exam by Commissioner

1 I appreciate this hasn't been done before, so no one
2 is in a position to be an authority on the subject, but
3 have you considered the matter and if so, have you any
4 question of the length of time that would be required?
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1 WITNESS DAU:

2 A Maybe I could help,
3 sir. If the failure was in a major river crossing
4 such as the Great Bear and the temporary facility
5 was put in in this period of one week, and you
6 then delayed to go back to do a proper job at a less
7 sensitive time, the time involved in putting in
8 that really new river crossing essentially would be
9 measured in months, it probably would take a
10 couple months to do that major type of a
11 crossing. On the smaller crossings on the Arctic
12 coast that would be a matter of weeks in my view.
13 I would suspect that at Malcom River in the winter
14 you could effect a new river crossing in a matter
15 of a couple weeks.

16 THE COMMISSIONER: Excuse
17 me, Mr. Bayly -- for interrupting.

18 MR. BAYLY: I am glad you
19 did, Mr. Commissioner -- I needed to sit down.

20 MR. SCOTT: Mr. Commissioner,
21 it is just about one o'clock and as a convenient
22 break has been forced on Mr. Bayly, perhaps this is
23 the time. Mr. Anthony asked if in view of the
24 fact that you have reserved a matter to be dealt with
25 first thing in the morning if he could make a short
26 submission to you with respect to it.

27 MR. ANTHONY: Mr. Commissioner,
28 this morning you took under advisement comments I
29 had made with respect to meetings between Arctic
30 Gas and the government and upon subsequent discussions

1 with Commission Counsel and other counsel I thought
2 it would be helpful to you if I perhaps stated more
3 explicitly and more clearly what it was that I was
4 concerned with and/or the specific of the request and
5 the reasons for it and I would suggest, that the
6 request that I have put forward is that the
7 Inquiry be provided with the minutes or in fact other-
8 wise insure that people are informed themselves of
9 the meetings ^{between} of the Government of Canada and Arctic
10 Gas or its consultants, in particular the two meetings
11 referred to by Mr. Williams in May of 1972 and any
12 other meetings where the question of route selection
13 was under discussion.

14 Now, the purpose of this
15 request is simple. I am merely attempting to determine
16 what discussions bearing on route location were
17 held between Arctic Gas or its consultants and the
18 Government of Canada. I am not interested in pursuing
19 the genesis of the 1972 pipeline guidelines. I
20 merely would like to get an indication of the
21 question of what discussions were held and what
22 directions with respect to route selection or any
23 other discussions in this regard to route selections
24 were made.

25 I may also say to prevent
26 delay or confusion on this matter, I am prepared to
27 direct these questions to Mr. Horthy's panel provided
28 there are people on the panel who are informed of these
29 meetings and can relate to the Inquiry what in fact
30 took place.

1 MR. GENEST: Mr. Commissioner,
2 my submission is that you should make no such order
3 because if what my friend Mr. Anthony now seeks
4 with respect to route selection is judged relevant.
5 as to which I will address you in a moment, then
6 any meeting between anybody representing Arctic
7 Gas and any member of the Government, any Government
8 official on any of the subject matters concerning
9 this Inquiry, any discussions that have been
10 held are equally relevant .

11 We are launched into a field
12 of Inquiry that in my submission is endless and
13 is not going to be productive in my respectful submis-
14 sion, to this Inquiry. I suggest that they are
15 not relevant unless my friend seeks to show that
16 directions were issued by the Government.

17 Now, you have cast by
18 your rulings a responsibility on Mr. Scott to call
19 witnesses from the Government. The Government may
20 have -- and I am not here to defend their case at
21 all -- but they may have a claim to put before you
22 that there may be a matter of confidentiality about
23 these meetings as to which they may have a position
24 to expound, so without hearing from them in the
25 first place, sir, I say that you ought not to make
26 a ruling about any minutes of any such discussions and
27 secondly I submit that they are not germane to the
28 subject matter of your Inquiry which is the impact of
29 this pipeline on the North.

30 Now, what discussions we

1 may have had with the Government -- and whatever
2 discussions we have had with anyone have produced
3 the pipeline proposal that you have before you and
4 it is the impact of that proposal that you have
5 to judge.

6 Now, I do not see how it
7 advances you , in my respectful submission, to
8 have--launch inquisitions into what happened in
9 Mr. So and So's office on such and such a date.

10 Those are my submissions,
11 sir.

12 THE COMMISSIONER: Do
13 you wish to add anything, Mr. Scott?

14 MR. SCOTT: Mr. Commissioner,
15 without being definitive because we have not had
16 much opportunity to consider it, may I make this
17 observation. It is true, as Mr. Genest has said,
18 that your mandate is to determine the impact of the
19 pipeline on the environment and the people of
20 the north and it is also true that Arctic Gas has
21 produced a proposal to be examined in light of that.
22 We have all, I think, recognized that we are entitled
23 to inquire of the applicant with respect to the
24 various kinds of input into his proposal that he
25 has received, such as environmental inputs, socio-
26 economic input and so on.

27 Mr. Anthony, as I understand
28 it, suggests that there may be -- I do not see any
29 mandate for putting it any higher, -- another
30

1 kind of input from Government which let us take
2 the worst case about which there is no evidence
3 which amounted to a direction that a pipeline
4 be placed in a certain way or at a certain location
5 or at a certain river crossing or adjacent to a
6 certain enterprise such as a highway. If the
7 allegation goes that far and it may be his burden
8 to establish the extent of it, it seems to me
9 very difficult to say that that is ^{not} / input that
10 may have affected the proposal that is before you in
11 just the same way as the environmental or socio-
12 economic studies are.

13 THE COMMISSIONER: Do
14 you wish to say anything else about all this,
15 Mr. Anthony?

16 MR. ANTHONY: No, my
17 reasoning I think is outlined in basically the
18 terms that Mr. Scott has outlined and I have nothing
19 further to add at this time.

20 THE COMMISSIONER: Well,
21 it is time to adjourn then. We will adjourn until
22 nine o'clock tomorrow morning.

23 (PROCEEDINGS ADJOURNED TO MARCH 14, 1975 AT
24 9:00 A.M.)
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347

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Vol. XVII

AUTHOR

Mackenzie Valley Pipeline Inquiry ; Vol. XVII

13 March

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347

M835

Vol. XVII



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